The Mining Journal
Established 1835 — Railway & Commercial Gazette
Vol. CCXXXIX No. 6098 — LONDON, JULY 4, 1952 — PRICE 8d

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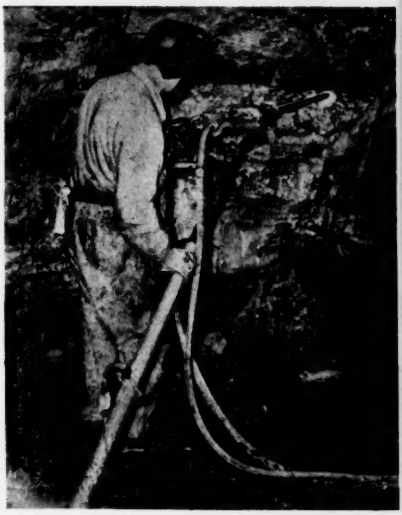

IN OPERATION IN CANADA: Holman DRYDUCTOR mounted on Airleg drilling dry rock. The photograph shows the two pipelines, one providing compressed air, the other leading the dust safely away from the operator.

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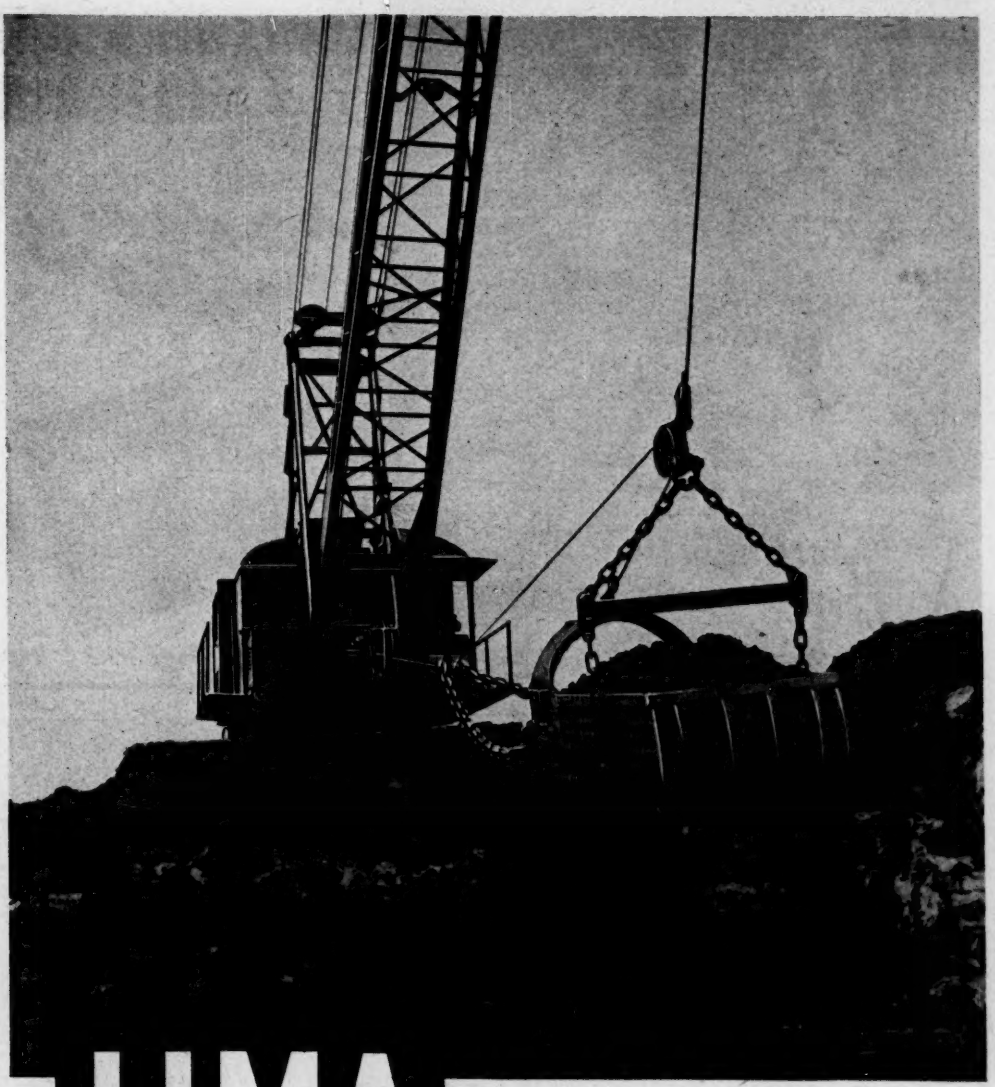

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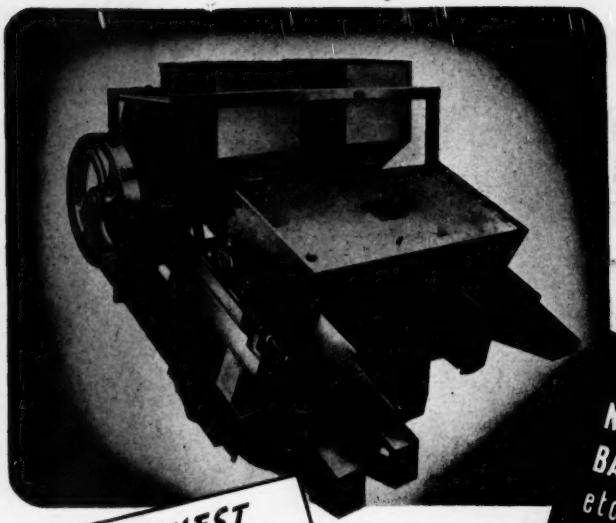

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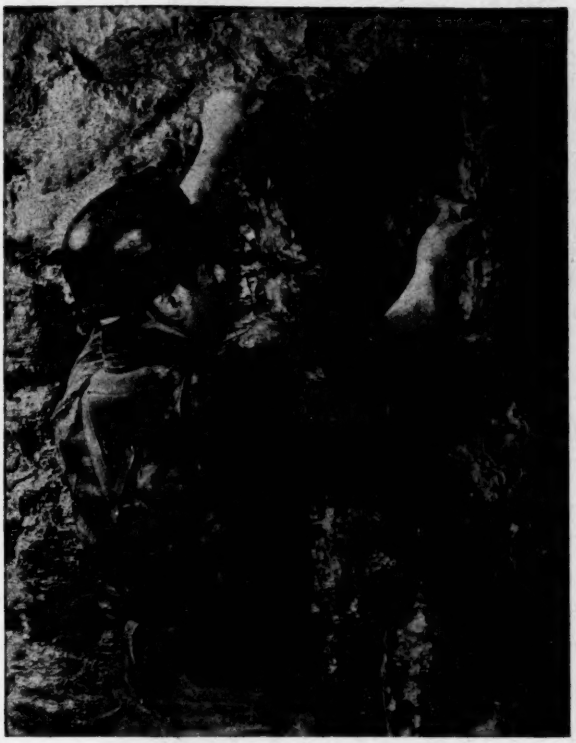

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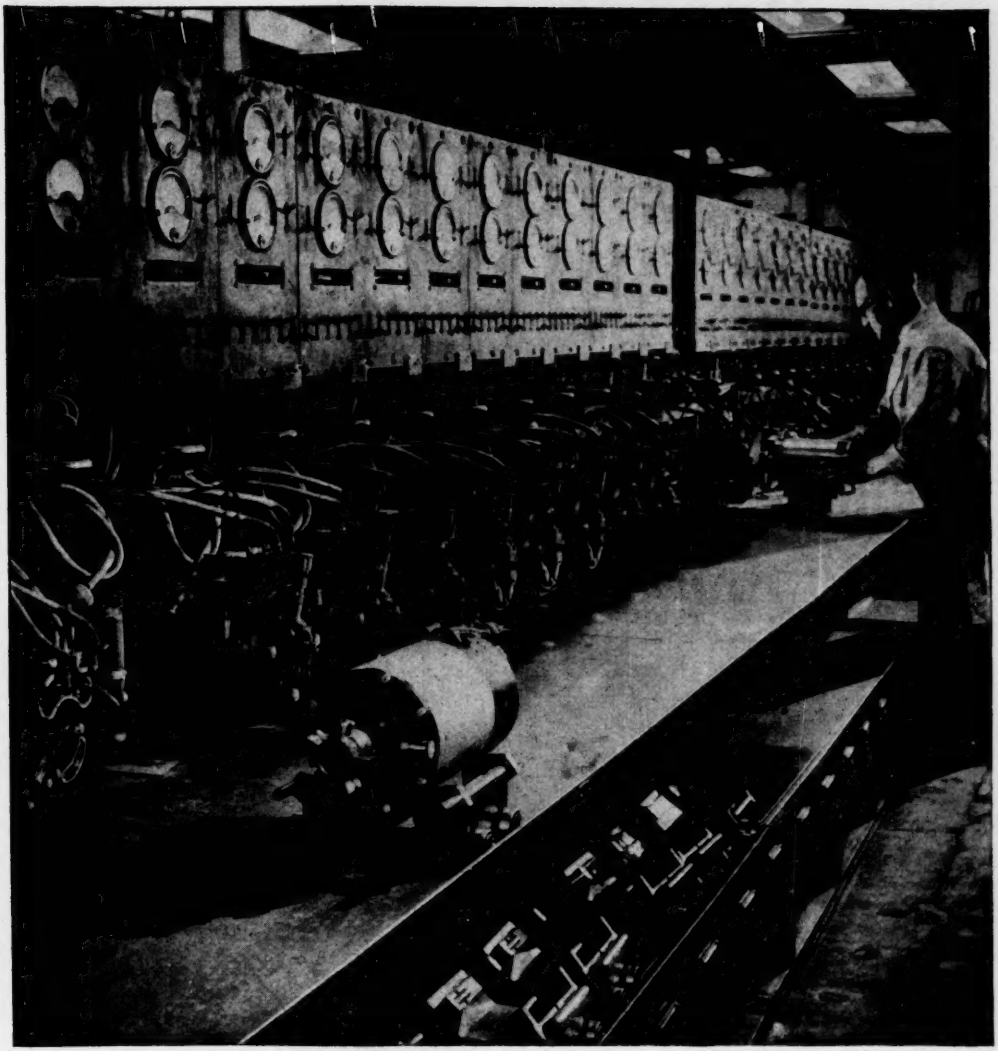

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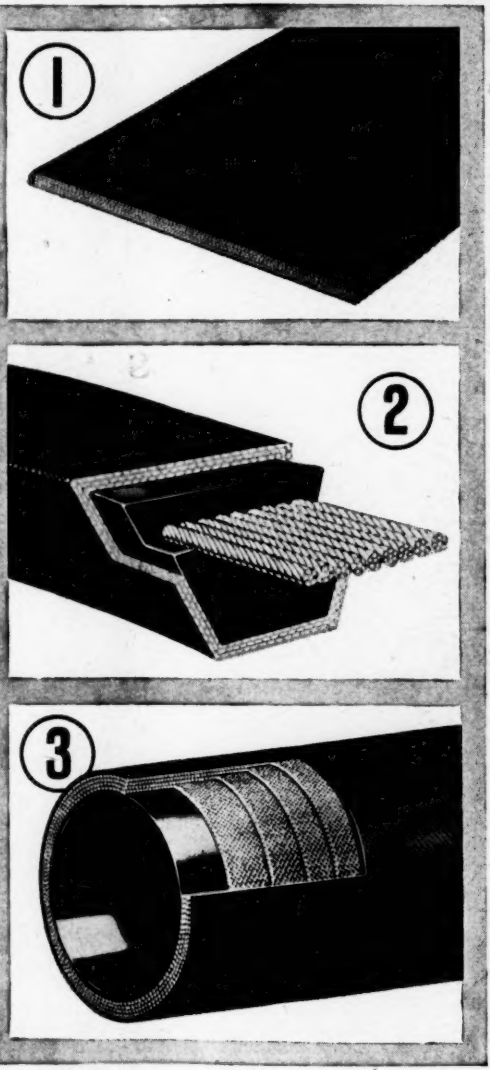

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The Mining Journal

Established 1835

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NOTES AND COMMENTS

A Plan for Steel

Synchronizing with the publication of the report on productivity in the iron and steel industry the British Iron & Steel Federation has issued a preliminary outline of a second post-war development plan which is designed to raise the U.K. steel output to a level of 20,000,000 tons per annum. Briefly, the conclusion of the Productivity team headed by Sir Charles Goodeve is that a large proportion of the British steel plant is too old and too small in capacity. As a consequence, British productivity is too low. The average output of the British steel worker is 1,241 ingot tons per annum compared with the American figure of 2,306 tons.

But there is another side to the picture. Steel is produced more cheaply in the U.K. than in any other country in the world except Australia and since the comparison is equally favourable in terms of quality there is no reason to take a dismal view of the outlook for British steel.

Any attempt to assess the extent of the future world demand for steel must be liable to a wide margin of error. During the last two years there has been an increase in world steel capacity of about 35,000,000 tons and expansionist plans in the U.S.A., not to mention Western Germany, are on an ambitious scale. Nevertheless, the British Iron & Steel Federation has formulated the new five year development plan on the basis of an ultimate output of 20,000,000 tons of steel and 15,000,000 tons of pig iron.

Obviously an increase in production of the order of 25 per cent in the next quinquennium will not only involve an enormous capital expenditure but will also require the mobilization of raw materials upon a scale far beyond past experience.

New sources of ore supply, particularly in Africa, are being developed. Special ore carrying ships are being built. The National Coal Board is exploring the problem of increasing the industry's supplies of coking coal by 7,000,000 tons per annum and of course new and bigger blast furnaces, coke ovens, open hearth steel furnaces and rolling mills will have to be built. Upon the validity of these immense schemes, the provision of labour and materials and the raising of a capital sum of not less than £300,000,000, decisions will ultimately have to be taken at the highest level. But it is first necessary to determine once and for all the question of future ownership. The further modernization of a vital industry cannot be undertaken until it ceases to be the bone of political contention. For that reason alone it is to be hoped that the Government will brook no further delay in the production of its promised Steel Bill.

Mineral and Oil Developments in Chile

An interesting survey of Chile's mineral and oil developments since 1946 was given by the President, Señor Gonzalez, in a recent address to that country's Congress. He referred to the Huachipato steel plant which had not only relieved the country from paying $U.S.15,000,000 p.a. for foreign supplies of steel, but also had brought into the country $U.S.36,000,000 from exports of iron and steel since the plant went into production in 1950.

Borings for petroleum, chiefly in the southernmost part of the Republic, had been increased from four in 1946 to 73 by the end of 1951 and exports of crude oil had yielded to date $U.S.7,000,000. The Concon oil refinery would be completed by next year.

The Paipote smelter, begun in 1947, had been finished in January last, and its estimated annual production capacity of copper and gold was 15,000 tons, representing about $U.S.20,000,000; the corresponding unrefined ores, which hitherto had, of necessity, been exported, realized only $U.S. 10,000,000 in 1950. Since 1946, President Gonzalez said, the sum of 4,500,000,000 pesos had been invested in these industries. Out of a total of $U.S.131,000,000 of foreign loans obtained by Chile for industrialization purposes, 80 per cent had been obtained during his presidential period.

Turning to nitrate production, he stated that from 1946 onward, annual output had been the highest on record since 1930. The commitment of $U.S.51,000,000 taken over by Nitrate and Iodine Sales Corporation on its formation in 1933 had all been met, and the funds previously earmarked for these obligations were now available, and being used, for improving production methods. One method evolved was the new solar evaporation process, which was expected to increase production, mostly of potash nitrate, by about 300,000 tons. Mechanized loading was now in full use at Iquique and would be installed at the port of Tocopilla next year.

After reviewing the difficulties the Chilean exchequer encountered over copper prices, the President mentioned the decision of the U.S. Government to lift the price control on foreign copper, thus abolishing the maximum price of U.S. 27.5c. per lb. to which, under the recently cancelled Agreement, 80 per cent of Chile's production was subjected. In this connection, a recent report from Santiago, Chile stated that this decision of the United States could not be considered as a solution to Chile's copper problem and that it was still obscure how it would affect the country's exchange earnings. It pointed out that the withdrawal of what was an important known quantity from the exchange budget was not likely to assist the maintenance of the free exchange regime which began some eighteen months ago and only recently had to be modified owing to a decrease in receipts of foreign exchange derived from copper sales.

Following the decision of the U.S.A., President Gonzalez announced that a Bill would be presented to Congress for the creation of a Chilean Copper Sales Corporation similar, it seems, to the Nitrate and Iodine Sales Corporation.

No Decision Yet on Volta River Project

The recent statement made in the House of Commons by Mr. Mackeson, Secretary for Overseas Trade, that he could not predict when it would be possible for any decision to be taken on the Gold Coast's Volta River Project for the production of aluminium reminds us that the discussions on this important development scheme between the delegates of the British Government and the Gold Coast Government, of the British Aluminium Company and of Aluminium Ltd., Montreal, have now been concluded. It may be recalled that the chief object of the Volta River Scheme is to harness the power of the 1,000 mile River Volta which crosses the Gold Coast from north-west to south-east, for the production of aluminium. To achieve this, it is proposed to construct a dam across the Volta at a point some 70 miles from Accra and to instal hydroelectric plant.

Discussions concerning the financing of this scheme began in London at the end of May and were resumed on June 5 in Accra when Mr. Oliver Lyttleton, the British Colonial Secretary, arrived there during his West African tour. The discussions, which ended on June 12, were held under the chairmanship of Dr. Kwame Nkrumah, the Gold Coast Premier, who said he hoped that the talks would lead to the foundation of a strong industry for the Gold Coast and would also lead to mutual confidence in developing these natural resources.

Although it is understood that good progress was made in discussing the main outstanding technical and financial questions there were certain points which required further examination before the governments and the companies would be in a position to undertake any commitment.

Details of the Volta River Project, which would make the Gold Coast one of the world's largest aluminium producers, were given in our issue of August 3, 1951.

Australia

(From Our Own Correspondent)

Melbourne, June 1

Expansion planned in the metallurgical industry in Tasmania is causing anxiety as to the adequacy of power to meet the future demand. Owing to prolonged drought, the water level in the lakes from which water is drawn for the hydroelectric generating stations fell so greatly it became necessary to impose a reduction of 25 per cent on all power users. This cut still operates, and it is stated that abnormal rainfalls are necessary to restore water levels to normal in the short period that is required by industrial expansion. To meet the coming requirements the Tasmanian Government has been pressing on with new water storages and generating plant, but doubt as to water supply coinciding with their completion continues. Electrolytic Zinc Co. of Australasia proposes to spend £A.4,000,000 at Risdon. Zinc production is already 80,000 tons per annum and in addition it is planned to produce 100,000 tons of sulphuric acid and 55,000 tons of sulphate of ammonia per year. The company will need an additional 13,000 h.p. It is stated that the aluminium industry will require about 30,000 h.p. initially. Construction of this plant, at Bell Bay, near Launceston, is proceeding, and power is to be supplied by a hydro-electric power plant in course of erection near Launceston, and independent of the main hydroelectric supply system of Tasmania. The chief factor adverse to this industry is the necessity to import bauxite from the mainland, Tasmanian ore being limited in tonnage and of inferior grade. Victoria has higher grade bauxite, but the reserve is not great, and it would seem that deposits in New South Wales will supply the largest tonnage to the works. As a war-time measure there is justification for establishment of the industry, but the economic aspect is not attractive.

DIAMOND DRILLING AT KALGOORLIE

The long range venture by Western Mining Corporation in the search for repetitions of the productive formations of the Golden Mile, is progressing. The work at the south end which is deeper, is much more speculative than operations to the east of the field. The southern work has shown the existence of gold at depths below 2,000 ft., and is being continued. Interesting results have been obtained in a diamond drill bore put out to the east to explore for a second quartz dolerite greenstone formation. The bore is reported to have entered the leases of Gold Mines of Kalgoorlie at 2,175 ft. The country is lightly sheared calc schist with some mineralization to 2,656 ft.; low gold values were met at several places, the highest occurring on a shear at 2,541 ft. with an assay value of 6.2 dwt. gold per ton over 36 in. Alternate calc schist and greenstone were passed through from 2,656 ft. to 2,743 ft. and from thence has continued in quartz dolerite to the present depth of 2,880 ft. Veins with carbonate, pyrite and tourmaline, but with low gold were met on a strong shear from 2,774 ft. to 2,778 ft.

CENTRAL NORSEMAN GOLD CORPORATION

Interest has centred in operations at Central Norseman Gold Corporation's mine, Western Australia, because of recent mill returns which have been much above the average grade of the mine. The high returns are due to the working of a stope, much above the mine average, and are not likely to continue; for this reason, there will probably be no change in the usual rate of dividend. Average grade of ore reserves is 8.5 dwt. gold per ton. There appears to be sound ground to expect that this average will be maintained, for recent development work in both the Phoenix and Princess Royal mines has disclosed ore approximating an ounce per ton.

Western United States

(From Our Own Correspondent)

Barstow, Cal., June 2

Gold mine operators have won a point in their fight to recover damages from the government for losses caused by Order L-208 issued in October, 1942. This order arbitrarily closed all gold mines until the end of the war on the allegation that they were not essential to the war effort. The theory was that the men so idled would seek employment in base metal mines but from that standpoint the order was a flat failure. Homestake of South Dakota and Idaho-Maryland and Central Eureka of California filed suits in the U.S. Court of Claims to recover damages incurred during the period that the order was in effect. Government attorneys petitioned to have the charges dismissed but the Court of Claims, by unanimous decision, rejected the petition.

An amendment to the Defense Production Act has been introduced in the Senate authorizing the proper authorities to make contracts for essential materials at over-ceiling or over-market prices if conditions justified. As a matter of fact some government agencies have been doing just this but the wording of the act on this point is somewhat ambiguous and the amendment has been introduced to clarify it.

ARIZONA

American Smelting and Refining Co. has commenced stripping its Silver Bell property as a preliminary step in its $17,000,000 development project. The Silver Bell includes two mines, the Oxide and El Toro, which, on the basis of churn and diamond drilling, are estimated to contain 32,000,000 tons of ore assaying 0.9 per cent copper. This would indicate approximately 500,000,000 lb. of recoverable copper.

San Manuel Copper Corporation has made application to the Reconstruction Finance Corporation for a loan of $111,000,000 for the development of its property at Tiger in Pinal County. The plans call for a 30,000 ton mill, 800 ton smelter, branch railroad, power and water systems and a townsite. While formal approval of the loan has not been announced officials of the R.F.C. have designated it as "a feasible and essential operation." It is expected that four years after start of construction San Manuel will have an annual production of 140,000,000 lb. of copper and 6,000,000 lb. of molybdenum and that this output can be maintained for 50 years.

Phelps Dodge has been carrying on research work for recovery of molybdenum from its Morenci ores and satisfactory process has been developed which will be applied to all concentrates. During 1951 the Morenci mill treated an average of 49,000 tons daily.

CALIFORNIA

The heavy snows of last winter brought avalanches in the Sierra Nevada reminiscent of past experiences in Colorado and Utah districts in the Rocky Mountains. The tungsten district in Inyo County was the hardest hit. Here Tungstar's mill was completely destroyed and U.S. Vanadium's mill badly damaged and the research laboratory, carpenter shop and some smaller buildings as well as several homes were destroyed. U.S. Vanadium is back in operation but Tungstar's mill will have to be rebuilt.

IDAHO

American Smelting and Refining Co. has entered into a 30-year lease on the holdings of Vulcan Silver-Lead Corporation and will continue the deep development programme of Vulcan initiated in 1951. Mine operators of the Coeur d'Alene district have been realizing the possibilities of deeper development for some time and this is one of many projects following out such a policy.

Sullivan Mining Co. has started an 8,500 ft. x 10 ft. haulage adit from the surface plant of Hecla (one of the owners of Sullivan) to Sullivan's Star shaft. This will reduce haulage distance and obviate a roundabout system of ore transfer so that Star will be able to mine ore considered submarginal under present conditions.

MONTANA

American Chrome Co., subsidiary of Goldfield Consolidated, has leased from the government the Mouatt chrome mine in Stillwater County. Mouatt is situated on a very large low grade deposit which was subjected to extensive development during World War II but never attained full scale production. The mine will be re-equipped, new installation including a concentrator of 1,000 tons daily capacity, and the government contracts to purchase 900,000 tons of concentrates over a period of nine years.

Coronado Copper and Zinc Co. has acquired the old Bluebird group and adjoining property in the south-western part of the Butte district and will start development at once. Bluebird, which has been practically idle for more than 50 years, was well known as a producer of silver but the ore was contaminated by zinc which was a liability in those days whereas it will now be Coronado's principal product.

NEVADA

Following a winter shutdown Simplot mine in Elko County has resumed shipment of iron ore under contract to three steel mills in Japan. From September, 1951 to the time bad weather enforced a shutdown the mine shipped 109,000 tons under its contract and plans an output of 300,000 tons for 1952. Dodge Construction Co. in Pershing County is also shipping to Japan at a rate of 5,000 tons weekly.

Kennecott is encountering difficulties in developing its Deep Ruth project in the Ely district. As part of this programme the Kellinske shaft was to be sunk from the 775 ft. to the 2,245 ft. level but in the course of the operation a water filled fissure was encountered which drowned out three pumps on the 600 level, rose 180 ft. in the shaft, broke into the adjacent Star Pointer shaft and flooded the two pumps there. Additional pumping facilities are being installed.

Apparently Newmont Mining Corporation still has faith in the Goldfield area as it is starting a new drilling programme adjacent to ground previously explored and on which operations were discontinued three years ago. Newmont has proceeded on the theory that in the hectic days when Goldfield was a sensational high grade camp many favourable indications were overlooked and that systematic geological work and exploration should reveal ore bodies that would be well worth while under present conditions.

NEW MEXICO

Phelps-Dodge is preparing to reopen its Burro Mountain mine at Tyrone which has been closed down for the past 30 years. Recent drilling indicates the existence of 100,000,000 tons of approximately one per cent copper ore amenable to open pit mining.

WASHINGTON

Chewelah Copper Co. has reopened the 4,200 ft. main adit of the old United Copper mine in Stevens County and is exploring and sampling old workings. When the property closed down more than 30 years ago mine records indicated the existence of 128,000 tons of ore in the stopes and if this is proved the mine will be put on production.

American Aid for Mines of the Free World

Last August President Truman established the Defence Materials Procurement Agency by Executive order for the purpose of developing metal and mineral resources both in the United States and overseas. To this end it is responsible for (a) purchasing metals and minerals for Government use or for resale (where appropriate within the framework of I.M.C. allocations), (b) encouraging the production of critical and strategic metals and minerals, where necessary (c) guaranteeing loans to potential producers, or (d) assisting in installation of additional equipment. The creation of this Agency centralized Federal activities which were previously performed by the E.C.A. (and later by the Mutual Security Agency), by the U.S. Bureau of Mines and by the Emergency Procurement Service of the G.S.A. The personnel of the D.M.P.A. has been largely recruited from these latter Authorities which of course continue to perform their other functions unconnected with the development and procurement of materials. An important segment of D.M.P.A.'s activities is directed to the development and procurement of mineral resources outside the United States. These activities in respect of Europe, Africa and Asia are now operated from D.M.P.A.'s recently established London office under the direction of Brigadier-General Thomas G. Wilson. However, prior to the creation of this agency much invaluable work had already been achieved, more particularly by the E.C.A. and M.S.A.

The article which follows attempts to indicate the scope, rather than to provide a complete summary, of the American assistance which had already been made available to mines throughout the free world prior to the establishment of the D.M.P.A. Part I of the article published this week deals with the African continent, while a subsequent article will be devoted to what has been achieved in Europe, Asia and Central America.

All over the free world prospecting and mining have been stimulated by grants and by loans begun under the Marshall Plan (E.C.A.), and continued by the Mutual Security Agency. Allocations totalling some $28,000,000 and £12,000,000 have been made available so far to British overseas territories in Africa, the Mediterranean, South-East Asia and the Western Hemisphere. The recovery of Western Europe has been hastened by financial assistance on a global scale, while large sums have been allocated to stimulate the expansion of minerals production in French Colonial territories, Thailand, and many other countries. The aid has come from three sources.

One source has been a special reserve fund set aside to aid the development of overseas territories through special projects. From this fund have come grants and loans to obtain U.S. equipment to be used for the expansion of bauxite mining in Jamaica, lead and copper in Tanganyika, cobalt in Northern Rhodesia, kyanite in Kenya, and similar endeavours. This special development fund has also been drawn upon to help the economic development of territories by providing American machinery and supplies for road improvements in various territories, power plants in Malta and Jamaica, and to help make geological and topographical surveys.

A second source for M.S.A. and E.C.A. aid has been the 5 per cent portion of counterpart funds which can be drawn upon for the development of scarce materials. Counterpart funds are the sterling equivalent set aside by the Governments concerned to match U.S. dollar grants. Ninety-five per cent of the counterpart funds made available by the British Government belongs to the United Kingdom and has been used with U.S. approval for recovery purposes; the remaining 5 per cent belongs to the U.S. and is used both for scarce materials projects and for U.S. Government sterling expenses.

The third source has been the Technical Assistance Programme started under the Marshall Plan and continued by M.S.A. Under this programme, which supplements the work of the U.S. Department of State's "Four Point" technical aid programme, American experts have been sent to a number of countries to carry out surveys. All the projects are aimed at strengthening the economies of the territories concerned and facilitating the production and transport of scarce raw materials.

ADVANCEMENT ON THE AFRICAN CONTINENT

In Africa large sums have been advanced for the exploration, development and production of scarce materials vital to the defence of the free world. Arrangements were recently concluded for the advance from counterpart funds of £103,000 to Associated Mines Ltd. and its associated companies with mines in Southern Rhodesia. The agreement provides that, as far as possible, the advance plus 5 per cent interest will be repaid by deliveries of asbestos of satisfactory grade. After the loan has been repaid, the U.S. will have an option to purchase a percentage of the asbestos produced until 1968. £29,000 of the advance will be used for an exploration and development programme and approximately £74,000 for a production programme. The major share of the expenditure for the initial phase of the programme will be for costs involved in extending present mine shafts and developing new ones. In the second phase the major share will go towards new equipment, refurnishing existing plant structures, and adding new ones. Completion of the first phase is set for not later than December 31, 1952, while the second phase should be completed twelve months later.

In 1949 E.C.A. approved a proposal to assist in the expansion of cobalt production in Northern Rhodesia. When Rhokana Corporation proposed to expand its cobalt plant, it became evident that if certain items required were procured in the United States, completion of the expansion programme could be effected some 18 months earlier than would otherwise be the case. Rhokana was therefore authorized by the British Government to acquire certain items of plant in the U.S. to the value of 550,000 dollars, this amount being made available by means of an E.C.A. grant.

Last year it was announced that E.C.A. had agreed to advance £3,000,000 sterling to Chibuluma Mines Ltd., a new company recently incorporated in Northern Rhodesia, to develop a high grade copper-cobalt ore deposit about seven miles west of Kitwe, near the southern border of the Belgian Congo. Chibuluma acquired the ore deposit from Mufulira Copper Mines Ltd. The reserves are estimated at 7,300,000 s.tons, averaging 5.23 per cent copper and 0.25 per cent cobalt. Chibuluma expects to spend, from its own resources, some £500,000 towards the cost of equipping and developing the property, which is estimated at £3,500,000. Production is scheduled to start in 1956. When the mine is in full production, it is expected to yield some 16,000 l.tons of copper and 500,000 lb. of cobalt annually.

LOANS TO CENTRAL AFRICAN AREAS

The U.S. Government has also agreed to advance $1,640,000 to expand the production of lead and copper in Tanganyika. The advance will be made by M.S.A. to Uruwira Minerals Ltd. for a development programme at its Mpanda mine. In terms of the contract, Uruwira is to spend an additional £325,000 on the mine expansion, of which amount £250,000 will be raised by the issue of convertible loan stock. The development programme calls for the installation of a mill to handle 1,000 tons of ore per day at the Mpanda mine. The dollar advance will be used for American mining equipment and services, additional equipment being obtained in the sterling area. The mining

programme will result in improved housing and general welfare provisions for mine workers. The M.S.A. advance, plus 5 per cent interest, is to be repaid in deliveries of lead and copper, which are to commence not later than January 1, 1954, and are to be completed by December 31, 1956. The contract gives the U.S. an option to purchase up to 50 per cent of the total Mpanda lead and copper production for ten years after the advance and interest have been repaid.

In 1949, E.C.A. provided $72,000 for the purchase in the U.S. of mining machinery for Kenya Kyanite Ltd., to assist in expanding the production of kyanite from 25,000 to 37,000 s.tons annually. The agreement provided that the increased production for a three-year period, totalling 36,000 tons, should be sold to the U.S. for its national stockpile. The E.C.A. dollars were given to the British Government, the arrangement being that the money should be lent, through the Kenya Government, to the company, which would repay the British Government in sterling out of the purchase price for the kyanite. E.C.A. provided the sum to the British Government on a direct grant basis, not as a loan.

In Nigeria, E.C.A. funds amounting to $344,000 were allocated in 1949 to help to expand the annual capacity of Enugu collieries in two years from 600,000 tons to over 1,000,000 tons. The additional tonnage is needed to meet the increased local industrial demand and to supply the Gold Coast with about 144,000 tons of coal a year to maintain rail transport facilities. Increased power demands for lead, zinc and sulphur production, cement manufacture and other vital industries are also expected to draw heavily on Nigeria's coal supply.

In French Equatorial Africa advances have been made to five companies engaged in programmes of diamond exploration. In 1950 E.C.A. advanced $500,000 and the equivalent of $1,100,000 in French counterpart funds under an agreement signed with Diamond Distributors and Compagnie Minière Oubanghi Orientale (of Paris). Repayment of the loan plus interest is to be in the form of industrial diamonds for U.S. stockpiling. The first payment was not due till after December 31, 1951, but nearly $44,000 worth of industrial diamonds was shipped to the U.S. last year, six months ahead of schedule. Contracts were also signed with Société des Reserches et de l'Exploration Diamontifers and with the Upper Sanga Diamond and Gold Co., both of which are C.M.O.O. subsidiaries. Last year E.C.A. announced two further advances against production totalling the equivalent of $1,303,500. Société Minière Intercoloniale was granted an advance of up to Fr.85,000,000 for exploration in its properties north of Bria, 5° N. of the Equator. If the exploration is successful E.C.A. will advance up to Fr.166,250,000 for development of the deposits discovered. The fifth contract in this territory provides for an E.C.A. advance of up to 205,000,000 counterpart francs for the expansion of diamond production in areas east and north of Berberati in which S.M.I. is already operating. In addition, S.M.I. is investing substantial sums on its own account.

TRANSPORT AND COMMUNICATIONS

Minerals development in Africa is also being assisted by allocations for the improvement of transport and communications. Among the major projects of this nature which E.C.A. and M.S.A. are helping to finance are the Gold Coast's proposed 50-mile rail link between Achiasi and Naawam, the improvement and expansion of the Rhodesian Railways, surveys for a new railway line between Northern Rhodesia and East Africa, and a survey project to lay the groundwork for better railway facilities between Southern Rhodesia and ports in Mozambique. It is noteworthy that a loan of up to £5,000,000 sterling to assist the present programme of the governments of Southern and Northern Rhodesia for the improvement of the Rhodesia Railways is to be repaid to the fullest extent possible in raw materials in which the U.S. is deficient, such as cobalt, copper, tungsten and chrome. Large sums have also been allocated for road development projects in the Gold Coast, Northern Rhodesia, Nigeria, Sierra Leone, Nyasaland, and French African territories. Belgium's "ten year plan" for the economic development of the Belgian Congo is being accelerated by a Marshall Plan loan of $15,600,000.

North Africa is also being assisted to develop its mineral resources to the fullest possible extent. In October, 1950, E.C.A. entered into an agreement with the French Government under which a contract was concluded for the sale of substantial quantities of Moroccan cobalt for the U.S. stockpile, financial assistance being provided in order that output might be stepped up as rapidly as possible to the levels envisaged in the contract. E.C.A. has also helped to provide equipment and technical guidance for the expansion of lead production in Morocco. The Moroccan Mining Research Bureau has been allocated about $300,000 to continue its prospecting programme. Much of this loan is being used for further research in the petroleum field located in North Central Morocco, where small quantities of crude oil were produced before the war.

From the inception of the aid programme on April 3, 1948, up to February, 1951, Marshall Plan dollar allocations to Western Europe totalled approximately $11,660,000,000. E.C.A. projects in France include oil drilling, potash mining and iron mining. Coal production in Bizone Germany has been assisted by the release of D.M.50,000,000 in counterpart funds for use as long-term capital investment loans to the companies concerned. Italy and Greece are other European countries to which allocations for the expansion of coal mining have been made. Yugoslavia's mining industries are benefiting from E.C.A. allocations having as one of their principal aims to minimize the difficulties caused by shortages of raw materials. E.C.A. loans of Esc.3,000,000 have been allocated for the development of wolfram properties in Portugal.

Venezuelan Iron-Ore

Under the terms of an agreement signed recently by the Orinoco Mining Co.—a subsidiary of United Steel which is to exploit the huge Venezuelan iron ore deposits from Cerro Bolivar—dredging commenced on March 1 from the confluence of the Orinoco and Caroni rivers downstream. This dredging, and the construction of several power plants, is expected to be completed within about three years. The dredging will provide a ship channel for 170 miles to permit ocean-going ore-carriers of draughts up to 24 ft. to proceed to Puerto Ordaz—on the confluence of the above-mentioned rivers—where they will be loaded with iron ore from Cerro Bolivar for transport to the United States.

The ore will be crushed and stocked at Puerto Ordaz and loaded aboard ships by conveyor belts. A 90-mile railway from the mine to Puerto Ordaz as well as a road for the trucking of supplies and other traffic will be constructed, and a contract for these two projects has been awarded to Morrison-Knudsen de Venezuela, an affiliate of Morrison-Knudsen, Inc., Boise, Idaho. Responsibility for the direct administration, co-ordination, and construction of the entire Cerro Bolivar project—exclusive of dredging—lies with Constructora Bechtel, S.A., an affiliate of the well-known Bechtel Corporation of San Francisco.

It may be recalled that Cerro Bolivar, situated to the west of the Caroni river, is a hill about four miles long and 4,000 ft. wide, rising to 1,800 ft. above the neighbouring plains. The entire top of this hill consists of high-grade iron ore. The average thickness of the ore is about 230 ft. and the maximum proven thickness is 550 ft.

The Outlook for Aluminium

In a recent report to the U.S. Defence Production Administration, Mr. Samuel W. Anderson (the Deputy Administrator for Aluminium in the Defence Production Administration) has made a very extended report which, though primarily directed to the possible requirements of the United States over the next six or seven years, contains much matter of general interest for world production and consumption generally. The following is the second portion of an extract of the full report, the first of which appeared in our issue of June 13.

These prospective surpluses lead us to the very heart of the most important question with respect to aluminium; namely, the stockpile question. Twice during the last decade the nation has been precipitated into a sudden crisis in which the demand for aluminium for defence and war purposes surged upwards violently and thus necessitated a drastic and painful readjustment in the economy. Fortunately, in each instance we have been able to proceed with whatever difficulties and at whatever uneconomic speed to set up the additional facilities without experiencing bombings and damages from an enemy. This might not be true if there is a "next time."

THE CASE FOR STOCKPILING

The accumulation of a stockpile of substantial size in any material as widely used as aluminium is exceedingly difficult, except during periods when the supply of the metal is in excess of the current needs for it. Contrariwise, the accumulation of a stockpile in periods of oversupply is easy and indeed represents a factor of stabilization in the economy, rather than a disruptive force.

The ownership of a large aluminium stockpile by the United States against any possible future crisis has quite a wide variety of advantages over and beyond those already outlined. It may be worthwhile briefly to outline these.

A large stockpile of aluminium represents a large stockpile of electric power. If we should have, for example, a stockpile of 4,000,000 s.tons, it would represent a stockpile of 80 billion kW. hours of electricity. This is about one-sixth of the anticipated kW. hours which will be generated in the United States in 1954. Although it is difficult to predict what conditions would be like in the event of all-out war, it seems reasonably clear that one of the most serious bottlenecks the country would face in such an unhappy circumstance would be an over-all power shortage. The magnitude of the power expansion in the United States in the last few years is difficult to grasp. The present power expansion programme, when completed, will result in a doubling of the generating capacity in the United States of approximately 50,000,000 kW. installed in 1948, to over 100,000,000 kW. installed in 1954 or 1955. This is a staggering fact and is a demonstration of the immense appetite for power of our growing economy and our defence effort. Even with much pressure behind it, the existing power expansion programme will hardly keep ahead of the estimated demands. When the present power expansion programme is completed, it is estimated that we will have a safety margin over peak demands of less than 15 per cent. This is considered by most power authorities a minimum necessary for safe operation. In addition, one must not lose sight of the fact that enemy action against an industrialized country may easily be concentrated upon power facilities as the most serious Achilles heel. Thus, the possession of a large, indeed a very large stockpile of aluminium in the event of war would place our minimum needs for aluminium metal largely beyond the reach of the enemy's attack and even, if necessary, lessen the drain from the aluminium industry upon scarce power supplies.

A large stockpile of bauxite would go far in avoiding the risks of ocean shipping during a war. We are now accumulating a bauxite stockpile. Nevertheless, a stockpile of metal in addition would save strain on the transport system and on the labour markets. A large stockpile of aluminium would also give assurances to the military services that both in their planning operations preparatory to a possible war and in the actual prosecution of a war, aluminium would not have to be conserved and could be freely used for those purposes which would serve the best military effort. This might be of tremendous importance if other materials at that time should prove to be suddenly in short supply. The existence of a large stockpile of aluminium would certainly greatly ease and facilitate such conversion, which inevitably would require many months.

Finally, it should be pointed out that a stockpile of aluminium does not deteriorate appreciably, does not have to be housed and represents, in effect, a prepayment on future military contracts. While a stockpile of as much as 4,000,000 s.tons of aluminium would cost about $1,450,000,000 and carrying charges, at 3½ per cent per year, would be about $50,000,000 annually, the initial cost represents an amount equal to the expenditures for defence purposes to-day of only about 15 days. We have, at present, an exceedingly small stockpile of aluminium.

SUPPOSITIONS OF SUPPLY AND DEMAND

If the civilian demand increased at the probably optimistic rate of 10 per cent per annum per capita (doubling in seven years), virtually no stockpile would be possible unless the additional supplies suggested from Canada and further domestic expansion were obtained. In the latter case, a stockpile of about 400,000 s.tons might be expected. If, on the other hand, the increase in civilian demand were to proceed at the average rate of 5 per cent per capita per annum, then our present prospective supply without any further additions would give us a stockpile by 1958 of about 710,000 s.tons. On the other hand, if we proceed with a further equipment of our supplies, as suggested, the stockpile can be expected to rise to a figure of about 2,500,000 s.tons by 1961. Adopting a still further conservative estimation of the increase in civilian demand; namely, at the average annual rate of 3½ per cent, our present supplies would permit us a stockpile of about 1,500,000 s.tons by 1961 and if the supply is enlarged, the stockpile might reach the rather large total of over 4,000,000 s.tons by 1964.

The U.S. Government has already entered into contracts with the three principal operators who are building the present expansion programme under which these companies may, at their election, sell to the United States Government at the then current market prices all of the metal produced by the new facilities for a period of about five or six years, extending in some instances as far as 1959. The theoretical commitment of the United States Government under these contracts amount to a total of 3,000,000 s.tons of metal. It is, however, very unlikely that anything like all of the metal produced from the plants will be sold to the Government. It is my belief that the existence of these contracts already assures, in large measure, the operations at capacity of the aluminium metal system for the next few years.

The independent fabricators of aluminium in the United States must secure the metal which they need from the producers of virgin aluminium, of whom there are only three in our country. These fabricators fall into two general categories, i.e., those who buy virgin or secondary

aluminium in the form of pig or ingots and those who buy semi-fabricated aluminium. The second of these categories contains the majority in number of the independent fabricators, but the first category represents a highly important and, in the aggregate of metal consumption, a very significant section of the independent fabricating industry. Those in the first category who use metal in pig or ingot form have complained for a long time that they were at a disadvantage as compared to the primary producers who are themselves fabricators of their own metal.

At the current price of 18c. per lb., profit made in the production of aluminium pig is quite low. The Aluminum Co. of Canada is primarily a producer of primary aluminium pig. Its fabricating facilities in Canada are comparatively small. It has none in the U.S. Its principal business consists of the sale of aluminium metal throughout the world. It is certainly the cheapest producer because of its attractive power resources.

The understandable sense of insecurity of the independent fabricators in the United States leads them to support with considerable vigour the idea of larger imports of metal into the United States from the Aluminum Co. of Canada for they believe that under these circumstances, they would be more likely to enjoy a reliable and continuous source of metal.

THE TARIFF FACTOR

There is at present an import tariff of 1½c. per lb. on aluminium ($30 per ton). While, of course, Alcan does not pay taxes in the United States on its income, nevertheless, the existence of the tariff does project an income to the United States, on the basis of importing 300,000 s.tons per year, of $9,000,000 annually. Furthermore, with respect to any metal which the Government might be required to take up from the Canadian imports under the suggested purchase agreement with Alcan, the metal would, in effect, reach the stockpile at the going market price less 1½c. per lb. (This would be the equivalent of 16½c. per lb. on to-day's market price of 18c. per lb.)

Within the framework of our country's needs for defence and on the theory that this may not be the last crisis facing our nation, the price of a large stockpile and of a generous supply of aluminium seems small indeed for the advantages which it will bring us.

Researches on Nickel Converter Practice

By C. C. DOWNIE

Researches on converter practice with nickel matte appear to have been somewhat sparsely dealt with in the little literature which has been published on the subject generally, although the same cannot be said of the handling of cupro-nickel mattes. This is revealed in various directions by the unwarranted linking-up of the two systems, as though they were one and the same. The matte produced from the magnetic pyrites but rarely offers the same initial smelting difficulties as do the garnierites, since it can contain anything up to 40 per cent iron oxide or more, whereas the latter may contain little more than 10 per cent. Hence the practice of operating at higher temperatures with garnierites is a matter of necessity. Where the use of the settler is dispensed with, and the matte run directly from blast furnace to converter, as is done where the work deals with a consistent run of ores, this higher temperature range is maintained. A minimum of 0.58 gallon per minute of water per sq. ft. of water-jacket area, in the blast-furnace, indicates a figure much in advance of what is probably ever required in handling magnetic pyrites following roasting, and which in turn is reflected in the greater fuel consumption in smelting garnierite briquettes. These have frequently shown as much as 22 per cent magnesia. Following refining in the converter, the pure nickel sulphide contains some 70 per cent nickel, with the remainder almost entirely sulphur, whereas the sulphur content of cupro-nickel matte sometimes ranges from only 18 to 20 per cent. Thus about one-third more sulphur is got rid of in the latter instance.

Whereas some firms adhere to a rigid schedule in the final minutes of the "blow," in order that over-blowing will not slag the nickel, other concerns operate in the opposite direction, and deliberately over-blow the refined matte.

DIFFERENT CONVERTER PROCEDURES

The toppings from this are collected and re-smelted in small 10 ton blast furnaces, but unless there is a sufficiently high copper content to justify it, the over-blowing system ultimately consumes far too much coke to be worth while. The method is really intended for mattes which contain copper contents much higher than the nickel proportions. Whereas the temperature of nickel matte as obtained from hydrated magnesium-nickel silicates can reach as much as 1,700° C. in the converter, a much lower temperature is advantageous when working to produce a nickel silicate slag. One recommendation is that the blow should be so manipulated that the temperatures range slowly upwards from 800°C. This would mean cooling down the matte as received from the blast-furnace, and evidently was to be done in conjunction with a silica flux raised to beyond a red-heat.

This flux, containing 70 per cent silica, is repeatedly charged in small quantities to remove the iron silicate slag. Further additions of the flux, and continuance of the blow, are carried out until nearly all the nickel has been removed as nickel silicate, leaving behind the copper with a modicum of nickel. There is little doubt that systems of the kind would suffice for rich copper poor nickel mattes, but otherwise the method means a return to the original blast-furnace to reclaim the nickel values. In some ways this corresponds to the earlier practice of "scraping" cupro-nickel alloys, or oxidizing them to remove the nickel before the copper, but which reaches the economical limit at about 80 per cent nickel.

Another method handles the material in a reverberatory furnace equipped with tuyeres, and where superheated steam is blown in along with the air, and to which is included the silica flux. By using two sets of tuyeres, one above the matte level, and the other below, this siliceous flux was understood to exert a better influence in getting more readily mixed with the turbulent mass. An investigation of this system revealed that the hearth required special construction, and that movable tuyeres had also been tried out. One advantage was that iron originally got oxidized and slagged off more rapidly, but the subsequent toppings towards the conclusion did not benefit. It transpired that a mixture of finely divided silica and common salt had also been included in the air blast, evidently with a view to exerting a chloridizing influence to again assist a separation of nickel and copper. A still further method comprised using a mixture of salt-cake and nitrates, but as can be well understood, the quantity of the latter would require to be low or the material might react with ex-

plosive violence. Although this system was not persevered with in the converter, it was apparently utilized as a means of furthering the familiar top-and-bottom process in the reverberatory process. While all proposals of the kind were given due consideration in the regular nickel smeltery,, although not necessarily applied on the large scale, some important small features arose which were taken advantage of. For example, it was recognized that the presence of small quantities of nitrates at the prevailing high temperatures could easily remove some of the sulphur from the salt-cake, apart from its action on the combined heavy metal sulphides. The soda in the flux is induced to absorb sulphur more readily from the matte as a consequence, and this continues until a critical figure is reached.

This in turn gave rise to the use of a patented flux for addition to the converter, which caused the small copper content to be removed comparatively completely, but the composition of which has been more or less retained private. In the initial mining, some deposits, which are worked as open quarries, have a life of only one or two years, after which new ground has to be opened-up, and hence the associated siliceous gangue, red clay, and fragments of decomposed serpentine frequently vary appreciably, as also do the copper contents, which sometimes range from 1.2 to 1.6 per cent.

VARIATIONS IN HANDLING NICKEL AND CUPRO-NICKEL MATTE

One composition in which no reference to copper is made, comprised 10 per cent nickel, 42 per cent silica, 21 per cent magnesia, 10 per cent iron oxide, 4 per cent alumina, 1 per cent lime, and 12 per cent water, but copper appeared to the extent of two to three points per cent in the refined matte, and as a rule was frequently more. Strange as it may appear, the dimensions of the converters used in one firm's different activities in France, Germany, and Glasgow, all differed quite markedly. For example, the diameter of tuyeres was ¾ in., 1 in., and 1½ in. for the different units. The minimum pressure of air to support a column of matte 14 in. high of some 4½ lb. per sq. in. has been criticized as very low, but nothing is allowed for the surging of the material, and a certain controversy took place betwen the different managements, as the greatest output obtained from the French converters. The depths of charges ranged from 14 in. to 15¾ in., and the amount handled varied according to the condition of the lining, since an old lining could accommodate a greater capacity. This ranged from 1½ to 3 tons, but the most that was charged in the works here amounted to some 56 cwt. which after refining was frequently reduced to 37 cwt. of refined matte, where the inside diameter of the converters averaged 1,256 sq. in.

One of the Canadian converter designs with a diameter of 5¾ ft., and using an air pressure of 6 lb. per sq. in., with 12 tuyeres of ¾ in. dia., could not apparently exceed this capacity, but it is known that improved constructions have since been installed. These and other dimensional features, with the blast used at different pressures and volume, were always under scrutiny, but would take too long to describe in detail. Briefly, nickel matte differs quite perceptibly in the converter from that of cupro-nickel matte. Firstly, having been produced in the blast-furnace at a much higher temperature, the brilliant scintillations for the first 10 minutes of blow are in much greater profusion. Secondly, the higher sulphur content also augments this. Thirdly, the lower iron content, which as a rule never compares with that obtained from roasted magnetic pyrites, does not allow this brilliant display to last so long, but the time occupied in making a complete clearance of the small copper content besides the iron, and giving the refined matte, occupies much longer. The average cupro-nickel matte rarely requires more than 50 minutes blowing, even although poor material containing up to 70 per cent iron sulphide is present, whereas nickel matte, with the various skimmings required frequently occupies more than twice this period, but which could, of course, be considerably modified if the material could be guaranteed copper-free. This does not reflect very materially on the costs, other than consumption of air-blast, but the lining is more seriously corroded, and each converter is "patched-up" between each blow period. The turbulence can be modified to some extent by additions of cold matte, but the practice of resorting to 10 in. levels, as has been done with cupro-nickel matte, was found superfluous.

Criticisms arose over a report that whereas 0.05 per cent copper was slagged off after the first 5 minutes, followed by 0.60 per cent in 10 minutes, this diminished to 0.3 per cent in 15 minutes when working a small charge, but which was what frequently occurred prior to introduction of the salt-cake treatment, and which necessitates lengthier periods ranging from 15 to 20 minutes application *i.e.*, for charges ranging around 1 to 2 tons.

ELECTRICALLY HEATED CONVERTERS

There is nothing new about the electrically heated converter, which dates back a matter of half a century, but which necessitates special construction, and which has seen service for handling other mattes.

It was early appreciated that solidifying difficulties could be largely forestalled if the mass could be retained molten indefinitely, while allowing the blast from the tuyeres to maintain the normal agitation. A slag, so rich in silica as to be unworkable in the ordinary process, can be maintained thinly fluid to flux iron oxide more readily, and after the removal of which, can be followed by de-sulphurizing to give coarse nickel suitable for electro-refining.

Thus instead of merely refining matte in the converter, the work goes further to the extent of producing a mixture of matte and coarse metal, and by liming under reducing conditions, more or less eliminates what sulphur is left. In following up this method, one smeltery which was not equipped for the electrical operation, investigated the possibilities of the process by sending sample lots of the normal refined matte, *i.e.*, coper-free, to an outside concern equipped with electric furnaces. The refined matte, containing anything up to some 28 per cent sulphur, made severe incisions in the basic lining of the hearth, and the calcium carbide slag formed by additions of lime and anthracite, required upwards of 2 hours to bring this down to 1 per cent, as much of the carbon was consumed in reducing the exposed nickel oxide. The controversy on de-oxidation versus de-sulphurization, however, was not overlooked, and it was recognized that this arrangement did not give the process a fair trial, since the electrically heated converter was enabled to eliminate a very large proportion of the sulphur by oxidation before the calcium carbide slag had to function. Such large sulphur reductions are denied to the normally operated converter, and in the ordinary way there is no alternative but to tap it into moulds for roasting treatment. The electrically heated converter thus functions in a dual capacity, allowing oxidation to proceed to a far advanced stage, and by finally de-sulphurizing, gives a product approaching that of metallic nickel.

It will be observed that this practice does not come into line with cupro-nickel mattes in the same way, although it holds good for nickel matte containing a small copper content, and which probably accounts for the system not being given the same attention, but the possible ramifications of which would appear to be quite considerable.

The Walker-Macard Axial Flow Mine Fan

Described by the manufacturers, Messrs. Walker Bros. (Wigan) Ltd., as the largest single axial flow mine fan in the world, the Walker-Macard fan has been purchased by the Zinc Corporation Ltd. of Australia. The following article gives a general description of the fan, and makes some note of its special features.

The Walker-Macard fan is a 209 in. diameter single stage adjustable pitch fan operated on direct drive by an 850 h.p. motor. The purchase of the world's largest axial flow mine fan by the Zinc Corporation Ltd. is due to the increasing scale of mining operations at the Corporation's Broken Hill property, where conditions are such that planing of underground operations is possible for a considerable number of years ahead.

The fan is to be installed on surface at the Broken Hill property's No. 2 Upcast Shaft which is 20 ft. in diameter and approximately 3,000 ft. deep. The fan will exhaust foul air from the various workings and will replace the existing axial flow fan which has been in operation about 10 years at the No. 1 Shaft. By use of the new fan at No. 2 Shaft, the existing ventilation system will be completely reversed. The shaft will function solely as a ventilation shaft.

Large installations are considered economical on mines as isolated as Broken Hill, for the property is well into the back areas with the result that power charges and transport costs are very high. Because of these factors it is necessary that all mine equipment operates at maximum efficiency. These considerations prompted the purchase of a second fan unit as a part of the overall installation. The second fan is intended solely as a standby.

The fan is intended to begin operations at Broken Hill in early 1953, and has been designed to cover summer duties from the initial duty of 720,000 c.f.p.m. at 2.69 in. S.W.G. and E.O. equalling 170 sq. ft. to a final summer duty of 900,000 c.f.p.m. at 3.74 in. S.W.G. and E.O. equalling 181 sq. ft. By blade adjustment the blade will cover an increase in equivalent orifice of about 25 per cent owing to winter conditions. From time to time speed and blade adjustments will be made to meet the changing mine conditions anticipated.

INTERCHANGEABLE FAN UNITS

In the complete equipment destined for Australia, two fan units, each 209 in. in diameter and of the single stage Walker-Macard design, are being supplied. Both are interchangeable and are mounted on carriages of patented design. The carriage wheels run in sleeve bearings.

The carriage is raised by hydraulic jacks and the wheels are designed to turn at right angles. In its movement from the equipment piece, the fan runs on lines to flat runway plates, and once clear of the mass of equipment, the wheels are adjusted and the fan moves to right or left as needs demand. The spare fan is then moved into position in a reversed sequence of operation and is fitted to the unit for service. Design and manufacture of the unit with first fan has been completed in approximately 15 months.

The second fan unit is generally similar in design to the initial construction, with the exception that all casings are constructed of Cor-Ten steel and that the rotor is fitted with internally operated variable pitch blades which can all be turned simultaneously to any desired position within the range of plus or minus 10 deg. by means of a specially patented toggle mechanism.

The fan drift, suction nozzle, diffuser and chimney are being constructed in concrete on the site and the total length of the complete fan and motor house will be nearly 200 ft. Each moving fan unit weighs approximately 40 tons, and overall weight of the mechanical equipment for the plant will be about 100 tons. All mechanical components of the plant have been designed to withstand a maximum of 1,200 b.h.p. at 296 r.p.m.

Owing to the different load conditions, efficiency of the fan varies up to a designed maximum of 81.4 per cent, achieved by use of a long diffuser type of fan and by arrangement of direct drive from an 850 Mather and Platt A.C. slip ring motor giving a speed variation from 240 r.p.m. to the maximum of 296 r.p.m.

FACTORS OF ROTOR CONSTRUCTION

The rotor consists of a cast steel hub mounted on the fan shaft, in which twelve cast manganese bronze blades are fitted. Each blade weighs approximately 5 cwt. and is about 5 ft. in length. All blades have been X-rayed and individually balanced, and are constructed first from a wooden pattern and subsequently from a pattern in aluminium.

Each blade shank is fitted with a special tensioning device, of particular interest, in that it ensures that the blade nuts can be quickly and accurately tightened or loosened without the exertion of undue force. This device is described as virtually a hydraulic chamber built into the shank of each rotor blade. The chamber is pressurized by a grease injector and the pressure can be related to the extension of the shank and therefore to the stress within the shank. The blade retaining nut is then locked, the pressure is released, and the shank is subsequently held tight by its own stress.

Each blade is in addition fitted with a device enabling the blade pitch to be set to very fine limits. The device consists of a mild steel cam passing through the blade shank which engages a slot in the hub. When the cam is rotated by spanner, the blade slowly revolves about its centre, and by means of a fixed index plate marked in degrees and mounted on the hub, the blades are thus set to any angular position within the range of plus or minus 10 deg. The rotor also incorporates a brake mechanism.

The fan shaft has a tensile strength of 30/40 tons per sq. in., and the extension shaft, at the inlet end of the fan, has a tensile strength of 28/32 tons per sq. in. and is approximately 45 ft. long. Both shafts have been supersonically tested. Flexible couplings of the Standage design connect the motor to the extension shaft and the extension shaft to the fan shaft.

Throughout the fan, bearings are suitably supported and are of the Michel tapered oil film type. Each bearing is fitted with a thermometer having dual contacts. Safety devices will stop the fan if the temperature rises too far.

ELECTRICAL FEATURES

The electrical equipment for the unit has been supplied under separate contract by Messrs. Mather and Platt. It is worthy of note that the D.C. motor is connected to the slip rings of the induction motor through a mercury arc rectifier and by this means, the output from the rotor of the induction motor when running at reduced speed, is converted into useful power.

The equipment consists entirely of standard industrial types of components, no special A.C. commutator machines being required as with similar types of speed control. The complete equipment comprises a wound rotor induction motor, liquid starter, six phase mercury arc rectifier with three/six phase transformer, D.C. motor with shunt regulator and two triple pole switches to connect starter and rectifier in circuit. A complete spare induction motor is provided. In the event of a breakdown on the D.C. motor or rectifier the main motor can run alone at full speed.

MACHINERY AND EQUIPMENT

Tubbing as a Shaft Lining

An interesting and well illustrated brochure received from Messrs. Head, Wrightson & Co. Ltd., gives details of the company's cast iron segments, which have made an important contribution to the mining industry, as tubbing segments in shaft sinking operations.

Recently a cast iron tubbing contract was completed by the company at a shaft in the Midland coalfields. The specific task demanded the erection of a water tight lining in heavily

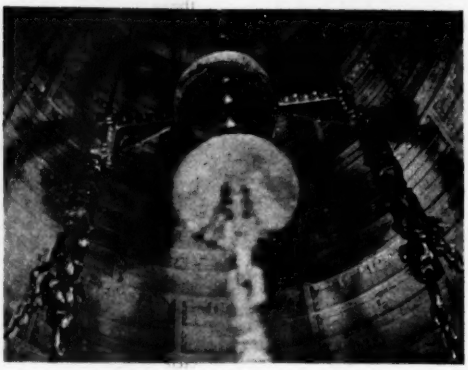

Photo courtesy National Coal Board.

Cast iron tubbing by Head, Wrightson & Co. Ltd., at a shaft in the Midland coalfields, showing centre sinking rope

watered Bunter Sandstone, the water being held back by an ice wall around the shaft during sinking operations. The temperature in the sinking shaft bottom was below freezing point and it was therefore essential for the lining to be of a material able to withstand high water pressures and to be unaffected by frost. Cast iron was recommended as the most suitable.

As will be seen from the accompanying photograph, by use of the tubbing system segments are lowered to position and are bolted together to form a solid structure. Tubbing segments are presented as being generally of larger and heavier design than the normal tunnel segments, and the analysis of the metal used is slightly different.

The brochure points out that in tunnel segments all cast iron work is preserved by being dipped in Angus Smith's composition whilst hot or by any other process required. Weight of iron is not allowed to vary above or below the calculated weight per cu. ft., according to scantling. Fittings include grout plugs, bolts, washers, nuts and grummets, and timber packings and jointing material are available if required.

Two-Way Radio Communication at Open-Pit Copper Mine

An information circular recently released by the United States Bureau of Mines gives details of the use of two-way radio equipment in the Kennecott Copper Corporation's open pit mine at Santa Rita, New Mexico. It is presented as being a time saving factor in mining operations, as well as increasing overall production and offering greater safety facilities to workers.

The system is the outcome of experiments which lasted nearly two years, and by its use the old method of communication by locomotive or shovel whistle and telephones has been discarded. Mining operations in the Santa Rita open pit cover an area of three miles, and because of this area as well as the general noise of work and blasting, communication was previously inefficient. With permission of the Federal Communications Commission, the Santa Rita mine now has 21 two-way F.M. radio sets in operation. One stationery set is installed in the control tower, ten mobile units are rigged in trucks, eight in electric locomotives, one in a diesel locomotive, and one in a mobile crane. The ten mobile truck units are assigned to pit foremen, the sample department, the track department, and other officials in charge of all departments of operations.

The advantages of the system are stated to include the routing of trains and locomotives from the central control tower instead of by telephone to a switch point; the locating of shovels and the speedy receipt of assay and general reports; foremen can converse with each other in co-ordinating the work programme, and safety precautions and repairs can be instigated with the minimum of delay.

An operator licensed by the Federal Communications Commission is in charge of, and responsible for, the approved operation of the industrial station of the mine. In addition, each operator of the base station is licensed under the Federal Communications Act.

Stewarts & Lloyds, Ltd., Film Preview

On Monday, June 30, Messrs. Stewarts & Lloyds Ltd. showed a preview of two films at the Gaumont British Theatre, London. Both films are now available for circulation.

The first, *Steel Pipes for Sindri*, is a 16 mm. sound and colour film of 10 min. running time. It shows the erection and laying on site of over 80 miles of pipework for the Indian Government fertilizer factory at Sindri. The company supplied all pipework for the project.

The second film, a 16 mm. sound or 35 mm. sound film in black and white of 35 min. running time, tells the story of the design and construction of the tubular steel jib of the W.1400 walking dragline. Entitled *The Great Jib* (see *The Mining Journal*, November 9, 1951) the film is concerned with the steel tube as a structural section. The film tells the story of an engineering triumph from its conception to the point where the jib is attached to the housing.

Both stories are told in language which will interest the engineer, the man-in-the-street, or his intelligent schoolboy son. The films are specially suitable for showing by schools, technical colleges, scientific bodies and trade associations.

New Safety Battery Torch

Weatherproof and flameproof, the new battery torch made by the General Electric Co. Ltd., has been designed to operate safely in mines and surface plants where inflammable materials are used. It carries Ministry of Fuel & Power and Home Office Certificates for use in situations where methane, petroleum vapour, acetone or town gas may be present.

The case is strongly made of cast aluminium alloy, the interior being treated with an anti-corrosive preparation. Armour plate glass forms the front lens, cemented in a screwed ring which eliminates rubber gaskets and is protected, in addition, by two stainless steel blades. The long-wearing labyrinth switch affords safe, easy action. A feature particularly useful in marine work is the hexagonal head, which prevents rolling when the torch is laid upon its side. This

The new G.E.C. safety battery torch

head is secured by a latch, which in turn can be locked against unauthorized interference by a lead seal or plug. A suspending ring is fitted to the tail of the case.

The 3.5v. 0.3 amp. Osram bulb is carried in a separate holder with a spring contact that obviates any crushing of the contact pip against the battery. This bulb-holder can be adjusted in relation to the reflector to give either a flood or spot light.

METALS, MINERALS AND ALLOYS

Another week has passed without the American steel strike ending. A few of the smaller firms and one larger concern, Pittsburgh Steel, have come to terms with the Union, but the number of men involved is only 50,000 against the figure of almost 600,000 still on strike. The number of steel workers returning to work is much less than the number of employees in the steel using industries who have been made idle. Already the figure has passed the quarter of a million mark and the rate is increasing. It is estimated that it will take at least two weeks from the resumption of production, before the flow of steel to even high priority users can recommence.

The confidence once felt that the U.S. defence programme would not be hampered by the lack of steel is oozing away. An Army spokesman has said that the production of Service aeroplanes had not been affected by the strike. But there are doubts whether this state can continue as steel stocks are used up. The workers seem to be less enthusiastic for making steel for defence than the Union officials, and the companies suspect that the price received for the steel would not meet expenses.

The scene is, however, being set for a return to work. The strikers themselves are now feeling the pinch and this hurts the more since the early enthusiasm has weakened. The companies, despite their elaborate arrangements, are faced with damage to the furnaces, and the men know well that if the furnaces are damaged there will be a suspension of work for a further period.

One of the side effects of the steel strike is the temporary suspension of the U.S. restrictions on the amount of copper and aluminium which can be stocked. Up to now, the limit of copper stocks was 60 days' working supply and of aluminium 45 days' supply. The National Production Authority has emphasized the temporary nature of this arrangement, and its determination not to allow steel users to ask for more steel to match the bigger supply of copper and aluminium.

The attempts in the U.S. House of Representatives to wreck the International Materials Conference, to forbid the importation of goods made from materials controlled in the U.S. and to end price controls have been frustrated. A Senate-House conference committee eliminated these amendments to a Bill extending price and wage controls for ten months. The original Bill expired on June 30.

COPPER.—The N.P.A. allocation of copper to brass mills and other users for July is about 30 per cent greater than the monthly average for the second quarter of the year. The authorization of 133,333 tons of copper from all sources has been possible because N.P.A. expects that U.S. manufacturers will be able to buy bigger quantities of foreign copper. This expansion in imports is the direct consequence of the O.P.S. formula for fixing the price of copper products in relation to the price paid for foreign copper. The total amount of 133,333 tons is composed of 80,000 tons of domestic metal and the remainder from overseas. This is in accordance with the pricing formula which reckons on 60 per cent of copper used coming from domestic producers and the remaining 40 per cent being imported. This improvement in the allocation is expected to be reflected in a growing scarcity of copper in the non-U.S. markets.

The Ministry of Materials is not to place an embargo on copper sales for August delivery. At one time, the trade had feared that an embargo would be re-imposed because price talks have been going on concerning the price which the Ministry is to pay producers. The increase of £44 per ton in the price payable to the producers is a temporary arrangement, however, and it remains to be seen what price will eventually be agreed upon with the Rhodesian and Canadian producers.

The Australian price of copper, despite the large changes which have taken place elsewhere, has remained unchanged at £A.285 per ton since last December.

Following the change in policy regarding foreign copper prices in the U.S., an Order has been issued giving exemption from price control of imported refined copper, and copper refined from imported copper ore and scrap. The trade, which was reported to be confused before the issue of the Order, had hoped that the new provisions would make the new position entirely clear. But it complains that confusion is even worse than before. The custom smelters feel that they are unable to proceed with the sale of their foreign copper until the position is really clarified.

Copper production in Mexico contracted during the first quarter of the year. Output was at the monthly rate of 3,244 tonnes, against the monthly average of 5,361 for 1951.

LEAD.—The re-imposition of the U.S. lead import duty was only a matter of time after the domestic price had fallen sharply. The duty was suspended in February until March 31, 1953, or until the national emergency ended, whichever was the earlier. The Bill authorizing the suspension contained a provision for restoring the duties when the domestic price for any given month fell below 18c. per lb. By the beginning of May, the price had fallen below that level. Now that the required period has elapsed President Truman has issued the expected proclamation. The rates are 1.1/16c. on refined lead and ¼c. on the lead content of ore and concentrates.

The U.S. Senate has been considering a Bill to extend for another year the extension of the suspension of duties on metal scrap including lead scrap.

The New York spot price of lead is now quoted at 16c. and E. St. Louis at 15.80c.

As foreshadowed in this column on May 30, D.M.P.A. is to buy 30,000 tons of lead over the rest of this year. It will be held as a low price reserve for resale to American industry, or if not required will go to the stockpile.

A falling off in demand from battery makers has cut consumption of lead in the U.S. during the first quarter of the year. Only 277,281 tons of lead were used in this period, against 346,781 tons consumed in the corresponding quarter of last year. The battery makers are expected to raise their demands during the rest of the year by a large amount.

TIN.—Malayan tin shipments in June amounted to 4,707 tons making a total for the first six months of 1952 of 30,606 tons compared with 31,980 tons in the same period of 1951.

Good results are hoped for from prospecting operations by the Billiton Tin Co. in Africa and the American continent. The search for minerals has already begun in these two Continents and the management proposes to reserve 1,500,000 guilders for creating a fund for exploration costs. According to the annual report of the company, just published, results so far this year have been favourable, but there are many uncertain elements and therefore no forecast can be made.

ZINC.—Supplies of zinc in the U.S. are now so plentiful that the restriction limiting stocks to 60-days' supply, has been abolished. In order to be able to ascertain any changes in the position, N.P.A. still requires users to report regularly the size of stocks on hand.

Another indication of the plenitude of supplies is that the price of zinc, prime western, f.a.s. export, has been cut to 14.00c. per lb. The previous price had been 14.25-14.50c.

ALUMINIUM.—For a year, the Ministry of Materials kept the price of aluminium unchanged but at the beginning of this year the price was raised from £124 to £148 per l.ton. At the beginning of April, the price of aluminium of 99 per cent to 99.5 per cent purity was increased to £154. The third increase of the year, carrying the price up to £157, has been announced. The Ministry blames the appreciation of the Canadian dollar for the necessity of the change. If the wage discussions being conducted in Washington result in bigger payments to the workers, a further increase in the British price of aluminium seems probable.

QUICKSILVER.—The London ex-warehouse price of Spanish quicksilver has been reduced to £65-£65 10s. per flask against £72 10s.-£73. Fore some time the American demand for quicksilver has been disappointing and the new price, equivalent to an origin price of $177 per flask, has been fixed with the idea of stimulating sales.

TUNGSTEN.—The price of tungsten is see-sawing downwards. At the end of last week the Ministry of Materials lowered its selling price from 500s. to 467s. 6d. per l.ton unit. At this time, the buying price for tungsten ore was 445s. This price was, however, reduced at the commencement of this week. The new buying price is 425s. The difference in the two prices

is accounted for by the cost to the Ministry of freight, storage handling and agents' commissions and by the provision which has to be made for the liabilities resulting from the Ministry's forward buying policy to ensure supplies to British industry.

URANIUM.—Although many decisions have yet to be made concerning the development of Australia's uranium fields at Rum Jungle, Northern Territory, operations are expected to start on a large scale before the end of the year. The Australians want to develop these fields with their own resources, but there is a possibility that overseas interests, chiefly American will have to be brought in to help with finance and technical assistance.

The Australian Government is reported to be willing to help the Government of South Australia to speed up the £A.7,000,000 development of the uranium field at Radium Hill. It is also reported that a treatment plant is to be established at Port Pirie on the Spencer Gulf. The strategic advantages of obtaining uranium from this part of Australia are quite clear.

Across the world, in Canada, $8,000,000 is to be spent on further development of the Canadian Government Eldorado Mining & Refining Co.'s uranium mine and mill in North-West Saskatchewan.

Iron and Steel

It is a remarkable fact that up to the end of the half year the arrivals of steel from the U.S.A. were ahead of schedule. Of course there will be a rapid shrinkage if the American strike goes on much longer, but latest information from the U.S.A. is that this is improbable.

In this country there has certainly been no relaxation of the pressure for deliveries of all classes of iron and steel products and we have arrived at the stage when imported tonnages very nearly approach the volume of exports. The Minister of Supply has again stressed the importance of a big export trade and has warned British steel users that in the issue of the new allocations for the third Period "increased preference" will be given to firms capable of expanding their exports.

The repercussions of the steel shortage upon industrial production are everywhere apparent. Shipbuilding programmes are falling behind schedule, engineering contracts are delayed, and if illicit transactions are few and far between, the willingness of hard pressed consumers to pay prices substantially in excess of the permitted maxima is an indication of the urgency of their needs.

Imports of foreign ore are well in advance of last year's figures and the freight market continues to move in favour of shippers, but expansion of blast furnace outputs is still regulated by the extent of the supplies of coke and coking coal.

The scrap situation is also improving although supplies still fall far short of the minimum requirements of the steel works and foundries.

More vigorous methods and effective propaganda have been rewarded by a gradual increase in the tonnages of iron and steel scrap which have been returned to the melting shops. There has also been an encouraging rise in the arrivals of foreign scrap and there are hopes that this rising trend will continue since there is now a bigger exportable surplus of scrap in West Germany.

At best, however, the scrap supply is precarious and steel makers are concentrating upon the expansion of the output of their own blast furnaces.

The London Metal Market

(From Our Metal Exchange Correspondent)

The tin market has been featureless, and the turnovers have diminished owing to lessening consumers' demand. Backwardation has tended to increase once more, but this is probably due to technical factors only.

The copper situation is becoming clearer throughout the world with the dollar price asked by U.S. firms settling down to about 35½c. per lb. f.a.s. although some European producers are willing to sell at less. In the U.K. the position is still chaotic as the Ministry have not been able to come to any agreement with the Rhodesian producers as to the price to be paid for metal bought after June 30, 1952, and although consumers are allowed to purchase their requirements up to the end of August, there is nothing to prevent the Government increasing their price, if this becomes necessary, with an addition for any losses made on sales on and after July 1, 1952.

The activity in the lead market has declined, and the export price from the North American continent has fallen to 14½c. per lb. f.a.s. The reason why this has not been reflected in a reduction in the official U.S. price is that the import duty on lead became effective again on June 26, at the rate of 1 1/16c. per lb. The zinc market remains featureless awaiting the end of the American steel strike.

On Thursday the official close on the tin market was: Settlement Price £970, Cash Buyers £969 15s., Sellers £970. Three months' Buyers £966 15s., Sellers £967. In the afternoon the market was steady. Turnover for the day was 110 tons. Approximate turnover for the week was 635 tons.

The Eastern price on Thursday morning was equivalent to £981 15s. per ton, c.i.f. Europe.

PRODUCTION OF TIN CONCENTRATES—MAY
(long tons)

	May, 1952	*Jan.-May*, 1952	*Jan.-May*, 1951
Belgian Congo.....	986	5,552	5,506
Bolivia	*3,659a*	*8,079b*	*7,030c*
Indonesia	3,043	12,927	12,678
Malaya	4,949	23,522	23,359
Thailand	690	3,533	4,700
Nigeria	659	3,415	3,472

Source: International Tin Study Group. *a*—March, 1952. *b*—Jan.-Mar., 1952. *c*—Jan.-Mar., 1951.

JULY 3 PRICES

COPPER

Electrolytic ... ... £281 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid ... ... £137 0 0 d/d
Soft empire ... ... £137 0 0 d/d
English lead ... ... £138 10 0 nom.

ZINC

G.O.B. spelter, foreign, duty paid ... £130 0 0 d/d
G.O.B. spelter, domestic... ... ... £130 0 0 d/d
Electrolytic and refined zinc ... ... £134 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over ... ... £225 per ton
Crude (70%) ... ... £210 per ton
Ore (60% basis) ... ... 25s.—27/6 nom. per unit, c.i.f.

NICKEL

99.5% (home trade) ... ... £454 per ton

OTHER METALS

Aluminium, £157 per ton.
Bismuth, 19s. lb.
Cadmium, 16s. lb.
Chromium, 6s. 5d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £65 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) 2s. 2d./2s. 3d. per lb. d/d
Osmiridium, £35 oz. nom.
Osmium, £70 oz. nom.
Palladium, £8 10s. oz.
Platinum, £27/33 5s. nom.
Rhodium, £45 oz.
Ruthenium, £30 oz.
Quicksilver, £65 ex-warehouse
Selenium, 25s. nom. per lb.
Silver 72½d. f.oz. spot and f'd.
Tellurium, 18s./19s. lb.

ORES, ALLOYS, ETC.

Bismuth ... ... 65% 10s. 6d. lb. c.i.f.
60% 10s. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 per ton c.i.f.
" " (concentrates) £13 per ton c.i.f.
" " Refractory £12 12s. per ton c.i.f.
Baluchistan Metallurgical ... £14 16s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... ... £10 - £11 d/d
Molybdenite (85% basis) ... 104s. 9d. per unit c.i.f.
Wolfram (65%), U.K. ... 425s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture) ... 32s. 9d. nom. per lb. (home)
Ferro-tungsten ... ... 29s. 9d. nom. per lb. (home)
Carbide, 4-cwt. lots ... ... £30 3s. 9d. d/d per ton
Ferro-manganese, home ... £43 15s. 2d. per ton
Manganese Ore U.K. (48%-50%)... ... ... 72d. per unit
Brass Wire ... ... 2s. 9½d. per lb. basis.
Brass Tubes, solid drawn ... 2s. 3½d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The better tendency reported in the market at the end of last week was carried through the current period. Although the volume of business transacted in mining shares was relatively small, a better tone was felt in nearly all sections.

The Rand returns for June was rather patchy and the general reduction in working costs noted in May was not held. Increases however, were usually small and in many cases some reduction was achieved. Taking the longer view, this will seems encouraging. The monthly figures in future will be computed on a fluctuating price basis governed by movements of the sterling-dollar exchange rate. Some interest from Paris was again evident and Johannesburg were reported to be buyers of Doornfontein on persistent rumours of good development results.

The South African Electrical Supply Commission has obtained a loan of $20,000,000 from the United States to be used for the purchase of generators. This is to enable uranium production to be increased and it is to be hoped that in the long run it may help to solve the problem of electric power for the mining industry.

During the week Stilfontein entered the ranks of producers with the chairman pouring the first gold bars.

The O.F.S. section, although recording many small gains, received a check. The Anglo American Corporation stated that a temporary curtailment of operations at Jeanette No. 1 shaft may be necessary, due to the difficulty of obtaining capital through public flotation in present market conditions. Free State Geduld lost ground following the disappointing shaft intersection. The reef was in a very broken condition and recovery was consequently small.

West African and Australian gold producers were still in the doldrums. It seems clear that a considerable drop in working costs must occur before investors will again interest themselves in these two sections.

Little interest was shown in the miscellaneous gold shares, but Champion Reef and Ooregum eased following rock bursts which occurred in both mines. In all, two persons were killed, seven injured and nine missing.

Copper shares again showed all round improvement. The news of a larger copper allocation in the United States, involving purchase of increased amounts of foreign metal, raised hopes that the recent higher price may be more permanent than was originally thought possible.

Lead/zinc shares were patchy and encountered profit-taking. The United States recently restored the import duty on foreign lead amounting to 1 1/16c. per lb. for refined metal and ¼c. for lead ore and concentrates. This was brought about by the fall in the metal price below 18c. per lb.

Tin shares, both Eastern and Nigerian, also recorded satisfactory gains. In the former category, Kinta and Gopeng mines had to shut down following damage to the Kampar water service pipe-line by terrorists. Later a cable received from Kinta Tin Mines reported that the pipe-line had been cleared of obstructions, and that the plant was undamaged. Beralt Tin finished the week a little better after initial declines following the lower price of ferro tungsten to U.K. consumers. This was lowered to 29s. 9d. per lb. from 31s. 8d. per lb.

Dollar issues were strong following good gains on Wall Street during the week. International Nickel and Noranda were outstanding in this section.

The higher price for South African coal favourably affected Amalgamated Collieries of South Africa and Natal Navigation. The pithead price of coal has been increased by 1s. 3d. a ton. Asbestos shares remained popular. Central Provinces Manganese recorded slight improvement. Associated Manganese of South Africa were still reported to be encountering rail transport difficulties in disposing of their ore. Wankie Colliery operating in Southern Rhodesia also went ahead. The labour position is reliably reported to be better than for some time past.

Oils returned to popularity. Shell Transport & Trading shares were quoted ex the 25 per cent bonus and the new shares improved and were eventually changing hands at around £4 each.

	Price July 2	+ or − on week
FINANCE		
African & European	2⅜	+⅛
Anglo American Corpn.	6⅞	+⅛
Anglo-French	19/4½	+7½d
Anglo Transvaal Consol.	28/9	
Central Mining (£1 shrs.)	36/10½	+1/10½
Consolidated Goldfields	45/-	
Consol. Mines Selection	24/4½	+7½d
East Rand Consols	2/9	
General Mining	4⅞	+⅛
H.E. Prop.	30/-	+7½d
Henderson's Transvaal	10/6	+6d
Johnnies	2⅜	−⅛
Rand Mines	6⅞	+⅛
Rand Selection	38/9	+1/3
Strathmore Consol.	28/9	+3d
Union Corporation	£8	+⅛
Vereeniging Estates	£4	+⅛
Writs	30/3xd	+3d
West Wits	43/9	+1/10d
RAND GOLD		
Blyvoors	42/-	+1/6
Brakpan	16/6	+9d
City Deep	32/6	+3/9
Consol. Main Reef	31/10½	+7½d
Crown	47/6	+7½d
Daggas	3½	+⅛
Doornfontein	28/3	+2/3
Durban Deep	3	+⅛
E. Daggas	18/9	
E. Geduld ... (4/- units)	43/1½	+2/1½
E. Rand Props.	3⅜	
Geduld	6⅛	+⅛
Govt. Areas	12/-	+9d
Grootvlei	31/3	+9d
Libanon	12/10½	+4½d
Luipaards Vlei	18/9	+1/9
Marievale	21/9	+3d
Modderfontein East	23/9	
New Kleinfontein	28/9	+3d
New Pioneer	14/3	+6d
Randfontein	19/6	+2/3
Robinson Deep	10/3	
Rose Deep	24/4½	+7½d
Simmer & Jack	5/7½	+1½d
S.A. Lands	40/-	+7½d
Springs	7/6	+6d
Stilfontein	26/3	+1/3
Sub Nigel	2½	
Van Dyk	12/3	
Venterspost	19/6	+9d
Vlakfontein	17/-	+6d
Vogelstruisbult	27/4½	+7½d
West Driefontein	6⅞	+⅛
W. Rand Consolidated	50/-	+7½d
Western Reefs	41/10½	+7½d

	Price July 2	+ or − on week
O.F.S.		
Freddies	7/10½	+1½d
Freddies N.	6/10½	+1½d
Freddies S.	6/10½	+1½d
F.S. Geduld	3	+⅛
Geoffries	17/-	+3d
Casts	19/-	+6d
Loraine	7/-	+6d
Lydenburg Estates	10/6	+3d
Merriespruit	4/-	
Middle Wits	16/3	+1/3
Ofsits	40/-	+7½d
President Brand	21/3	+7½d
President Steyn	18/6	
St. Helena	17/6	+4½d
U.F.S.C. & G.	6/6	+6d
Virginia Ord.	11/6	+6d
Welkom	27/6	
Western Holdings	3½	
WEST AFRICAN GOLD		
Amalgamated Banket	1/4½	
Ariston	5/4½	
Ashanti	16/9	−9d
Bibiani	6/-	−4½d
Bremang	2/7½	
G.C. Main Reef	3/7½	−1½d
G.C. Selection Trust	6/6	3d
Konongo	2/4½	
Lyndhurst Deep	1/1½	
Marlu	1/3	
Taquah & Abosso	3/-	−3d
AUSTRALIAN GOLD		
Boulder Perseverance	2/3	
Gold Mines of Kalgoorlie	9/3	
Great Boulder Prop.	5/3	−3d
Lake View and Star	15/3	+3d
Mount Morgan	17/3	+3d
North Kalgurli	12/9	
Sons of Gwalia	8/6	
South Kalgurli	8/6	+4½d
Western Mining	7/7½	−1½d
MISCELLANEOUS GOLD		
Cam and Motor	40/-	−1/10½
Champion Reef	6/3	
Falcon Mines	8/6	
Globe & Phoenix	24/6	
G.F. Rhodesian	6/7½	
London & Rhodesian	4/6	
Motapa	2/-	
Mysore	3/3	
Nundydroog	5/6	+3d
Ooregum	2/9	−1½d
Oroville	10/9	

	Price July 2	+ or − on week
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	22/6	
Zams	36/6	+6d
DIAMONDS & PLATINUM		
Anglo American Inv.	4⅜	+⅛
Casts	29/3	+1/-
Cons. Diam. of S.W.A.	4⅛ xd	+⅛
De Beers Defd. Bearer	68/6	+3/3
De Beers Pfd. Bearer	13½	+⅛
Pots Platinum	9/6	−3d
Watervaal	16/3	
COPPER		
Chartered	63/1½	+2/-
Esperanza	3/9	
Indian Copper	3/4½	−3d
Messina	4⅛	+⅛
Nchanga	7⅜	+⅜
Rhod. Anglo-American	58/3	+1/9
Rhod. Katanga	12/9	+1/4½
Rhodesian Selection	18/3	+6d
Rhokana	22½	+½
Rio Tinto	£23½	+1½
Roan Antelope	14/-	+1½d
Selection Trust	41/-	+2/6
Tanks	61/-	+1/-
Tharsis Sulphur Br.	39/-	
TIN (Eastern)		
Ayer Hitam	23/9	+1/-
Bangrin	8/-	+9d
Gopeng	10/3	−6d
Hongkong	6/9	+1½d
Ipoh	21/-	+4½d
Kamunting	11/3	+10½d
Kepong Dredging	6/9	+1½d
Kinta Tin Mines	13/1½	−1/-
Malayan Dredging	24/3xd	+9d
Pahang	14/7½	+1½d
Penjalen	10/-	+7½d
Petaling	14/9	+4½d
Rambutan	11/10½	
Siamese Tin	20/4½	+4½d
Southern Kinta	15/4½	+1/7½
S. Malayan	24/9xd	+1/-
S. Tronoh	15/-	+3d
Sungei Kinta	19/4½xd	
Tekka Taiping	8/1½	
Tronoh	23/9	+1/3
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	8/10½	+1½d
Beralt Tin	20/3	+3d
Bisichi	3/6xd	+1½d
British Tin Inv.	15/4½	+6d
Ex-Lands Nigeria	4/9	+3d

	Price July 2	+ or − on week
TIN (Nigerian and Miscellaneous) contd.		
Geevor Tin	12/3	+10½d
Gold & Base Metal	3/4½	+4½d
Jantar Nigeria	6/1½	−1½d
Jos Tin Area	10/3	
Kaduna Prospectors	3/9	
Kaduna Syndicate	4/6	−3d
London Tin	5/4½	+4½d
United Tin	2/6	
SILVER, LEAD, ZINC		
Broken Hill South	47/6	
Burma Corporation	1/9	+3d
Consd. Zinc	28/3	−2/3
Lake George	16/6	+6d
Mount Isa	35/-	−1/6
New Broken Hill	26/3	+6d
North Broken Hill	56/6	−1/-
Rhodesian Broken Hill	17/6	+4½d
San Francisco Mines	31/9	+1/3
Uruwira	5/3	−1½d
MISCELLANEOUS BASE METALS & COALS		
Amal. Collieries of S.A.	45/-	+3/9
Associated Manganese	40/-xd	
Cape Asbestos	17/-	+10½d
C.P. Manganese	48/-	+3d
Consol. Murchison	36/6	+1/-
Mashaba	8d	
Natal Navigation	3½	+⅛
Rhod. Monteleo	12/6	
Turner & Newall	80/-	+1/-
Wankie	17/9	+1/-
Witbank Colliery	2½	
CANADIAN MINES		
Dome	$35	
Hollinger	$26½	−$½
Hudson Bay Mining	$102	
International Nickel	$82	+$2½
Mining Corpn. of Canada	£5½	+£¼
Noranda	$147	+$4
Quemont	£8½	+£½
Yukon	4/1½	
OIL		
Anglo-Iranian	5⅜	+⅛
Apex	40/-	+2/6
Ashtok	23/9	+2/6
Burmah	64/4½	+3/9
Canadian Eagle	32/6	+1/6
Mexican Eagle	22/7½	+4½d
Shell	3⅜ xd	
Trinidad Leasehold	27/9	+1/3
T.P.D.	28/3	+1/3
Ultramar	27/7½	+1/3

COMPANY NEWS AND VIEWS

Gold and Base Metals' Heavy Royalty Charges

In last week's issue we had the opportunity of reviewing the accounts of the Bisichi Tin Co. and noted the damaging effects of the increased scale of royalty payments operative in Nigeria during 1951. Now we have to hand the report and accounts of the Gold and Base Metal Mines of Nigeria for the same year, in which it can be clearly seen how these increased Royalty charges payable to the Nigerian Government have reached the point where Nigerian tin producers are having the utmost difficulty in retaining sufficient revenue out of profits to finance their production and reorganize their capital equipment, without seriously weakening their liquid resources position.

During 1951 the company produced 540 tons of tin concentrates and 22 tons of columbite, as compared with 553 tons tin and 14¼ tons columbite. The fact that gross revenue from the sale of tin at £399,586 amounted to virtually the same as in the previous year, when tin revenue totalled £397,832, indicates a higher revenue per ton realized. But the sharp rise in mining costs from £151,976 to £193,792 and the increase in the royalties paid to the Nigerian Government of £39,221 to £68,676 nullified this price advantage and after meeting tax liabilities of £40,300 (£84,018), the net profit available for distribution at £33,334 was less than half the corresponding figure for 1950 of £71,099.

In the circumstances the maintenance of the dividend at 15 per cent per 2s. 6d. stock units was better than might have been expected. In order to continue their policy of increasing the ratio of mechanical methods of tin winning to hand labour, the company has found it necessary to allocate as much as £75,000 (nil) to general reserve, which operation, however, has reduced the carry forward to £37,622 against £106,850 brought in.

Mr. O. V. G. Hoare, chairman, in his annual review, devotes a good deal of attention to the subject of royalty payments to the Nigerian Government and not only emphasizes that the Nigerian Government were able to exact royalty payments amounting to £68,676—a sum almost equal to the company's net profit before tax, and nearly double last year's payments of £39,221—but also points out that the heavy drain on cash resources arising from such payments is hampering the company's mechanization policy. This statement carries even more force when it is realized that Royalty payments are made on an average some three months before payment is received for the production on which they are levied. However, it would appear that the Nigerian Government is now well aware of the consequences which must follow, should Nigerian tin producers have to continue operations under such an impost, particularly as the price of tin has receded substantially from its former peak.

The Financial Secretary's budget speech made this year in the Nigerian Constituent Assembly noted that the present scale of royalties had become unrealistic in the lower and middle-price brackets, and would, if the price of tin fell very much further, inflict inequities on tin producers and damage to the Nigerian tin industries. It may therefore, he added, be necessary for the Government to re-examine the scale of royalties in the light of the changes in the cost of production of tin and the prices of tin during the past year.

Rand and O.F.S. Mine Returns for June

Generally lower profits and higher working costs featured the June returns of the Rand gold mining companies. Allowing for the shorter month, however, some of the figures compared favourably, and out of the 43 producers announcing returns, higher profits were made by 12 mines and 31 lower. A drop in working costs was registered by 14, on 24 they were higher and 5 worked for the same figure as in the previous month. Lower tonnages were milled by 35 mines, 7 crushed more and one the same.

Lower tonnages and profits characterized the outputs of the Central Mining producers—Crown mines being the only one to announce a higher profit in face of a rise of 1s. 2d. per ton in costs; those of City Deep came down by 11d. per ton although profit was less by £7,200. Blyvoors reduced tonnage and 10d. increase in costs led to the profit registering a decrease of £53,601. East Rand Props profit was down by £13,700 following lower tonnage and increase of 6d. per ton in costs.

All the Gold Fields subsidiaries dealt with smaller tonnages and announced decreased profits with the exception of West Driefontein which crushed less and showed a rise of 4d. per ton in costs to 65s. 1d. Vlakfontein was the only mine to report a lower figure of costs. Simmers profit was £8,200 down, Sub Nigel's £13,300, Venterspost £9,300 and Luipaards Vlei £11,800.

A mixed showing was made by members of the Anglo American group; five mines put through a larger tonnage, and reported higher profits. Daggafontein, Springs and Western Reefs worked at the same figure of costs as in the previous month; those of the other producers were down.

The only member belonging to Union Corporation to announce a higher profit was the O.F.S. producer, St. Helena; it resulted from a higher tonnage, better yield and drop of 2d. per ton in costs. East Geduld and Grootvlei also worked at a lower figure of costs.

The profit figures of the "Johnnies" members did not show a great variation from those of the previous month. Randfontein was the only one to announce lower working costs but the saving of 7d. per ton was not sufficient to raise the profit in view of the 12,000 tons lower crushing.

Company	June, 1952 Tons (000)	Yield (oz.)	Profit (£000)	Year ends	Current Financial Year Total to Date Tons (000)	Yield (oz.)	Profit (£000)	Last Financial Year Total to Date Tons (000)	Yield (oz.)	Profit (£000)
Gold Fields										
Libanon	78	15358	34.0	J	955	181,966	433	986	178,300	553
Luipaards V.	97	18145	42.5	J	1189	221,604	615	1215	225,466	784
Rietfontein	27	5985	27.3	D	162	35,954	166	163	36,250	189
Robinson	116	19140	12.2	D	670	109,128	60	657	104,497	75
Simmer & J.	120	19160	11.8	D	741	117,957	97	740	117,781	189
Sub Nigel	64	22115	173.4	J	794	277,350	1502	796	296,193	1851
Venterspost	95	21375	52.3	J	1180	260,650	727	1263	266,302	1111
Vlakfontein	36	13561	77.3	D	220	82,127	468	217	82,067	478
Vogels	77	20817	84.0	D	472	123,114	476	452	113,524	500
West Drie	24	12943	82.9	J	115	49,194	232	—	—	—
Anglo American*										
Brakpan	123	21501	35.9	D	692	126,521	224	680	127,661	355
Daggas	237	56370	398.8	D	1394	332,713	2362	1365	338,833	2602
East Daggas	100	17776	62.1	D	579	103,713	383	592	109,119	516
S. A. Lands	113	20254	69.2	D	667	120,312	434	675	118,136	474
Springs	168	21889	19.0	D	987	129,123	108	1003	130,304	210
Welkom	57	10207	12.7	D	276	43,807	L79.1	—	—	—
W'tern Reefs	115	23959	104.1	D	662	139,045	620	573	129,647	671
Central Mining										
Blyvoor	105	64312	563.2	J	1298	819,176	7300	1093	772,268	7141
City Deep	150	30291	23.0	D	920	185,209	161	968	197,217	462
Consol M.R.	190	25878	38.3	J	2283	312,352	501	2261	305,179	621
Crown	261	42752	44.2	D	1594	259,828	216	1630	279,708	650
D. Roodep'rt	183	30872	84.2	D	1073	183,722	492	1074	182,979	607
East Rand P.	211	43782	133.6	D	1249	267,783	916	1295	263,140	1058
Modder B.	57	6297	6.0	D	341	37,595	41	324	37,152	55
Modder East	115	13531	25.1	J	1409	165,656	350	1457	174,225	588
Rose Deep	85	11804	10.0	D	504	69,940	67	492	69,430	135
Welgedacht	32	3899	4.1	J	405	47,758	49	396	45,988	49
J.C.I.*										
E. Champ	31	4485	8.1	D	186	28,299	50	195	28,644	65
Govt.G.M.A.	251	31300	50.1	D	1420	192,358	298	1367	187,577	352
New State	45	6247	1.0	D	269	39,248	6	356	46,213	21
Randfontein	353	40413	30.0	D	2102	250,382	175	1992	243,320	297
Wit. Gold	58	6995	2.5	D	355	42,373	15	354	40,816	25
Union										
East Geduld	141	42304	333.9	D	864	259,223	2045	863	258,938	2116
Geduld Prop.	102	14804	33.5	D	626	90,829	220	629	93,004	283
Grootvlei	195	42220	272.9	D	1163	252,047	1616	1170	262,949	1795
Marievale	59	14898	68.5	D	361	90,423	421	363	90,479	452
St. Helena	49	9760	6.0	D	272	53,528	20	—	—	—
Van Dyk	105	15114	12.1	D	640	92,528	74	600	90,488	115
General Mining*										
S. Roodep'rt.	26	5827	21.6	J	324	70,575	270	321	71,901	271
W.RandCon.	218	34237	131.3	D	1263	197,573	742	1257	201,240	965
Anglo-Transvaal*										
N.Klerksd'p.	11	1271	1.0	D	66	7,425	6	52	6,170	7
Rand Leases	188	31361	75.1	J	2218	372,157	952	2222	361,008	1118
Village M.R.	34	5317	15.5	J	408	63,619	205	414	63,510	231
Others										
N. Kleinf'tn.	108	14207	31.0	D	630	83,019	486	644	83,693	260
Spearwater	10	2290	L2.6	D	61	14,085	L17	62	14,091	L14
W. Nigel*	16	—	5.5	J	135	—	13	120	—	22

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

Company Shorts

Middle Wits Profits Decline.—Although profit before tax of Middle Witwatersrand (Western Areas) for the year 1951, at £130,952 showed a decline of £276,815 compared with the preceding year it must be regarded as satisfactory as the 1950 figure included the item of £347,558 vendor consideration arising from the cession of the two mining leases to Virginia and Merriespruit. Taxation took £50,150 (£79,993), and after allocating £250,000 (nil) to general reserve the carry forward was £377,059 against £546,257.

Quoted investments appeared in the latest balance sheet at a cost of £759,151 (£1,026,962) and consisted mainly of holdings in Virginia, Merriespruit, Stilfontein, Welkom, Orange Free State Investment Trust and Wit Extensions. The market value of the company's quoted investments at the end of 1951 was £1,247,954, thereby reflecting a surplus of over £488,000 compared with the book value. Mr. S. G. Menell is chairman.

Motapa's Profits Halved.—Although the tonnage crushed by Motapa Gold Mining during 1951 was satisfactory at 281,250 tons (253,350 tons) the grade of ore put through the mill was down to 1.99 dwt. (2.18 dwt.) but the total gold produced improved to 28,020 oz. (27,710 oz.). Costs rose 1s. 8d. to 21s. 11d. per ton and the working profit of £43,724 was less than half the previous year's figure of £88,060. To the net profit figure of £36,216 (£79,644) was added £55,750 brought in, making £91,966 available. The sum of £39,959 (£45,576) was allocated to general reserve bringing that account up to £155,535 and the remainder, £52,007 was carried forward.

Difficulty is still being experienced with metallurgical recovery due to the refractory nature of the ore. While the company should benefit from the Southern Rhodesian Government's decision to allow the mines to sell the whole of their output on the free market. Motapa has a long way to go before it begins to measure up to the high hopes that were held when it was launched early in 1947.

Amalgamated Banket Pays 2½ Per Cent.—Amalgamated Banket Areas has returned to the list of dividend payers after an absence of 12 years with a payment of 2½ per cent, in respect of the year ended September 30, 1951. A preliminary statement making this announcement reports that profit for the year at £227,497 (£203,402) to which was added £126,452 (£1,633), making £353,949 (£205,035) available. Expenditure pending resumption of production at the Fanti and Tamsoo mines was £113,106 (£64,297) the sum of £112 (£111) was written off subsidiary company account, and after distributing £37,864 to shareholders the carry forward amounted to £202,867 compared with £126,452 brought in.

Wage Increases Cut Profit Margins at Taquah and Abosso.—Taquah and Abosso Mines in a recent circular to shareholders have announced that as a result of the agreement reached between the Chamber of Mines and the Mine Workers' Union the company's African pay roll has been increased, with effect from April 1, 1952, by 18 per cent, equivalent approximately to an additional 4s. per ton of ore milled at the present rate of production. This, together with other increased costs has brought the operating costs at the mine up to 60s. per ton of ore milled when milling 23,000 tons per month. At these figures, the circular states, the present reserves of first-class ore become marginal at the official price of gold, and profit can only be obtained by sales of gold at a premium or by a substantial increase in the rate of production.

Owing to seasonal shortage of labour and in spite of a satisfactory increase in efficiency in recent months, production has recently been below normal and, until output can be increased, operations may run at a loss. Every effort is being made by the management to effect economies and to increase production but unless and until there is a change for the better in operating conditions the possible margin of revenue over expenditure is extremely slender and would disappear with any fall in labour efficiency or in production. It is proposed to continue operations in the hope that an improvement in the economic conditions may occur.

Offin River Gold to Work its Diamondiferous Areas.—The Offin River Gold Estates have announced that as the British Diamond Co. in the Gold Coast Colony has decided not to work the company's diamondiferous areas the company is making arrangements to work the property itself. This news was given in a circular to shareholders informing them that negotiations relating to the sale of timber on the company's properties have been completed and an approved agreement is now awaiting signature.

Seltrust Investments Increased Dividend Income.—Consolidated net profit for the year ended March 31, 1952, of Seltrust Investments after providing for all charges including £816,185 (£430,795) for taxation, amounted to £524,456 against £460,938. The increased income was due to larger distributions made by the American Metal Co., Consolidated African Selection Trust and Tsumeb Corporation.

Selection Trust owns all the ordinary issued share capital of £650,000 and 250,000 of the 1,250,000 4½ per cent Cumulative Redeemable Preference shares of £1 each. The dividend distribution was 27s. 6d. per ordinary share. Mr. A. Chester Beatty, Jnr. is chairman. The annual meeting will be held in London on July 17.

Trepca's Claim Reduced to £5,200,000.—Trepca Mines valued its properties in Yugoslavia at £8,837,255, a figure which the company's directors considered was calculated on fair and reasonable lines and based on the best available technical opinion. They are, therefore, appealing against the recent award by the Foreign Compensation Commission which valued their claim against the Yugoslav Fund at £5,200,000. However, as the global compensation payable by the Yugoslav Government to H.M. Government for nationalized British interests in Yugoslavia amounts to only £4,500,000 the sum ultimately awarded to Trepca will be based on a ratio which each established claim bears to the total amount of all established claims against the Yugoslav Fund.

Mount Morgan's Capitalized Bonus Issue.—Mount Morgan shareholders at an extraordinary general meeting to be held on July 3 will be asked to approve a special resolution to increase the company's capital from £350,000 to £1,400,000 in order to make a capitalized bonus issue of three new shares of 2s. 6d. (Australian) for each one held at the close of business on June 27 and to convert these shares into stock units. Shareholders will then hold four shares of 2s. 6d. each and it is proposed that these be converted into one stock unit having a nominal value of A.10s. each.

Copper Price Key to Mount Lyell's Future.—Mount Lyell, Australia's biggest copper producer has at least another 22 years life provided the copper price remains at a reasonable level according to results of a recent survey, says Reuter. The survey said about £2,000,000 was now being spent at Mount Lyell to increase output mainly by open-cut mining so that present production of about 8,000 tons a year would rise to 12,000 tons in the next year or so.

Mount Lyell is probably the lowest-yielding commercial mine in the world, the ore body containing about three-quarters per cent of metal to the ton, and the price of copper therefore is the key to its future.

I.N.C.O. Negotiates for Minnesota for Nickel and Copper Lands.—The International Nickel Co. are negotiating for the purchase of 5,000 acres of nickel and copper bearing land, south of Ely, Minnesota, says Reuter. If the sale is completed and plans materialize the firm will establish north-eastern Minnesota's first nickel and copper mine.

Amalgamated Metal's Large Profit Expansion.—Group profit, of Amalgamated Metal Corporation for the calendar year 1951, after all charges, including £1,066,343 (£339,881) for taxation went ahead from £252,996 to no less than £1,030,548. Shareholders receive 8 per cent (7 per cent) on the £4,453,792 ordinary capital. The carry forward was £1,214,133 against £524,716 brought in.

The directors state that in publishing the group profit figures for 1950 reference was made to the loss incurred by a major subsidiary through the incidence of commodity contracts maturing in 1950, and to the profits of corresponding contracts which would mature in 1951 and would more than offset the loss in 1950. These contracts were implemented in 1951 and the profits on them, amounting to approximately £470,000 before tax, account for part of the increase of £1,504,014 in the profit before tax for 1951 compared with 1950. Mr. W. Gardner is chairman.

Johnson, Matthey & Co. Form South African Subsidiary.—Johnson & Matthey have announced that they propose to form a subsidiary company in South Africa under the title of Johnson, Matthey & Co. (South Africa) Ltd., with offices in Johannesburg. The initial objectives will be to meet from local production the industrial needs of South Africa for noble metals, and to manufacture the requirements of the jewellery, dental and allied trades. Mr. J. A. Shaw, hitherto Assistant Manager of the Shepherds Bush Works, London, has been appointed Manager and will leave for South Africa in September, together with Mr. E. C. Deering, a director of the London company.

Transvaal Chamber of Mines.—At the Annual Meeting of the Transvaal Chamber of Mines, the following were elected to serve on the Executive Committee for the year now current: President: Mr. C. S. McLean; Vice-Presidents: Mr. W. H. A. Lawrence and Mr. C. B. Anderson. Remainder of Executive: Sir George W. Albu, Messrs. P. M. Anderson, B. L. Bernstein, S. R. Fleischer, W. M. Frames, R. B. Hagart, P. S. Hammond, H. C. Koch, S. G. Menell, H. F. Oppenheimer, K. Richardson and D. A. B. Watson.

UNION MINIÈRE DU HAUT KATANGA

The Annual General Meeting of the Union Minière du Haut-Katanga, held in Brussels on June 26, approved the accounts for the year ending December 31, 1951.

Mr. Gaston Blaise was in the chair.

Gross profit was 4,130,279,201 francs. Deduction of depreciation, reserve for profits tax and other charges left a net profit of 2,560,281,683 francs. The amount carried forward from 1950 of 111,804,549 francs gave a balance available for distribution of 2,672,086,232 francs.

After bringing forward 77,437,865 francs and deducting appropriations to the Reserve Fund, the Special Reserve and Contingencies Fund, the available balance was 1,575,142,676 francs. A dividend for 1951 of 1,000 francs net per share was approved by the meeting. Taking into account the 500 francs already paid in accordance with the resolution of the Extraordinary Meeting of Shareholders held on November 22, 1951, there remains a dividend balance amounting to 500 francs net per share.

MR. E. SENGIER'S STATEMENT

Mr. E. Sengier, Chairman of the Executive Committee, addressing the Meeting, began by confirming, with pleasure, that in 1951, as in 1950, everything went well and favourable factors only were recorded.

On the one hand, substantially increased profits have enabled the Board to propose the distribution of a dividend increased by one-third to 1,000 francs net per share, after payment of more than two billion francs for taxes and duties, allotment of one billion francs to the reserves and of eight hundred million francs to the amortization account.

On the other hand, important construction works have been accomplished within the scheduled time and according to our programme. Thanks to the above-mentioned reserves and amortizations these works have been financed by the profits of the year.

If one looks back over the past seven years, i.e., from 1945 to 1951, one finds that the roughly 35 billion francs deriving from our various receipts were utilized as follows:

Production expenses	15 billions, i.e. about	42%
Taxes and royalties	8 ,, ,, ,,	23%
Net dividends	5 ,, ,, ,,	14%
Capital expenditure	6 ,, ,, ,,	18%
Investments and increase in bank deposits	1 ,, ,, ,,	3%

The receipts of the 1951 financial year amount to 8 billion 800 million francs. Three items of the 1951 expenses, which are a counterpart of these receipts compare as follows:—

1. Remuneration of European and native staff ..... 1,009 millions, i.e. about 11.4% of the receipts.
2. Net dividends to shares subscribed in cash..... 978 millions, i.e. about 11.1% of the receipts.
3. Taxes, duties, dividends to shares statutorily held by the Government and participation of same in the royalties paid to the Comité Spécial du Katanga..... 2,410 millions, i.e. about 27.4% of the receipts.

CONSTRUCTION WORK

1951 and 1952, said Mr. Sengier, are two extremely important financial years which will be marked by the accomplishment of a great part of the construction works meant to ensure the future of our Company.

From 1953 or 1954 on, we expect to be able to spend annually about 800 million francs for our construction works, corresponding to a more or less normal annual amortization figure.

Taking into account figures already known and assuming normal sales, it may be expected that the 1952 results will be higher than those of 1951. This would enable us to meet the capital expenditure in connection with the above-mentioned construction works while maintaining or improving our present cash situation.

Our Company's results are not only related to metal quotations but also to costs, said Mr. Sengier, and this year again these costs compare favourably with those of our competitors.

This statement is a tribute to the ability and the devotion of our entire staff which constitutes the most valuable asset of the Company.

Regarding results and costs, the Union Minière has the benefit of two favourable conditions:—

(1) some important elements of its copper production costs vary with the metal quotation, e.g. transport tariffs, duties and taxes, royalties, which if they share in the increase of prices, also participate in the reduction of profits resulting from fall in copper prices;

2) it produces other metals than copper, in particular cobalt, the price of which is generally not influenced by variations in copper prices.

Our production of zinc, further stated Mr. Sengier, although a secondary activity for our Company, is important for the Belgian zinc industry which finds there a substantial part of its supplies.

During the seven post-war years, Katanga will have supplied the Belgian zinc plants with 740,000 tons of concentrates containing 370,000 tons of zinc of a total value of 3 billion 800 million francs.

The part played by our Company in the Belgian economy can easily be measured if we say that our sales in dollars from 1945 to 1952 will have reached a total of some 220 million dollars. Speaking of the present situation of the metals market, Mr. Sengier reminded that the attitude of the large copper producers, including this Company, to sell their production at official quotations, as well as the regulation agreed upon between governments for the allotment of the metal have certainly checked unsound speculative movements which only affected a small proportion of the world production.

He said he considered 27.5 cents per pound of copper a price exceeding the average quotation on which the profits of a period of several years might be estimated.

There were unfavourable factors such as the increase of about 250,000 tons that may occur in the near future in the world production and the tendency to substitute aluminium and plastics to copper. But on the other hand the constant improvement of the standard of living was definitely a favourable factor which would lead to an increased consumption of electrical equipment and as a consequence to an increased consumption of copper.

This trend and the stockpile needs had led the United States to import during 1949, 1950 and 1951 respectively 400,000, 530,000 and 350,000 tons of copper mainly from Chilean mines.

In our annual reports, further said Mr. Sengier, we kept you informed about the capital expenditure programme necessary to maintain or increase our deliveries of saleable products.

PROPOSED INCORPORATION OF PART OF RESERVES

In principle, replacements of installations or works indispensable to maintain operation at the level of progress are financed by the Maintenance Fund, the Amortization Account and the Renewals Fund, but works intended to develop our industrial equipment must be financed with cash.

We chose to use our available cash which is the counterpart of our reserves.

This method logically leads to incorporate a part of the reserves to the capital of the Company.

Consequently your Board intends to summon an Extraordinary General Meeting before the end of the year, to submit to you the proposition of increasing the Company's capital from three billion francs to five billion francs by incorporation of part of the reserves. This new capital will be represented by the already existing 1,242,000 social shares which will not be altered in any way.

I trust that the information contained in the report to the General meeting together with the information I have just given you will reassure the shareholders for the future.

The Government of the Colony and the Comité Spécial du Katanga to whose confidence we pay tribute will be further convinced from year to year that our main concern has been the general interest of the country and the moral and material fate of the Congolese population which is under our care and which leads a happy family life in our social centres.

The report circulated to shareholders shows that in 1951 out of a world copper output estimated at 2,600,000 tonnes, Union Minière produced 191,959 tonnes as against 175,920 tonnes in 1950.

This figure, the highest one ever reached since the origin of the Company, as well as the production of 5,715 tons of cobalt, could not have been realized without the electrical energy supplied by the Bia power-plant, the output of which is nearly half that of the Francqui power-plant.

Ore mined during the year totalled 4,762,000 tons as against 4,317,066 tons in 1950.

Thanks to further research the ore reserves have still increased in spite of the ore mined during the year.

Besides copper and cobalt, the uranium-radium ore production has been carried on and the radium content recovered in relation with the commercial demand.

110,836 tons of crude and 43,130 tons of roasted zinc concentrates were delivered to the Belgian zinc industry at a moment where zinc ores were strongly wanted.

As a by-product of the roasting operation, 24,316 kilos of cadmium were recovered by Sogechim.

Refining of blister copper by the Société Générale Metallurgique

de Hoboken yielded 118,046 kilos of silver and 14.7 kilos of gold.

The workings in connection with the development of the Company's operations have been actively pushed on during the year 1951.

At the Kambove-West mine, a future underground mine, surface installations have been assembled.

In the Western group of mines, the electric haulage has further been extended to railway lines of the Company's own system.

Both concentrators at Kolwezi and at Kipushi have been enlarged in view of meeting the increased production of the mines that they serve.

Additional equipment has been put into service in the Jadotville plants. In particular, a copper refining furnace and a 3,000 kVA cobalt electric furnace have been fired during 1951.

POWER SUPPLIES

For the moment, the Company consumes the power produced by two hydro-electric power-stations: the Francqui and Bia stations on the Lufira River.

Early in 1953, the Delcommune power-station, which is at present in course of erection at the Lualaba River, will enter into production, with an installed power of 120,000 kVA.

For the further future, a second power station on the Lualaba River, to be named Le Marinel power-station, should be erected downstream of the Delcommune power-station. It will work under a fall of more than 200 m. and will have an installed power of 300,000 kVA.

With these four power-stations of a total installed power of 530,000 kVA at its disposal, Union Minière will be in a position to produce about 2.5 billion kWh per average year.

SOCIAL ACHIEVEMENTS

At the end of 1951, the Congolese population living in the social centres of the Company numbered 59,610 persons.

The health situation is excellent and constantly increasing owing to the close co-operation between the services in charge of the native labour and the medical service.

In 1951, for the first time, a bonus has been deposited to the Savings Account of those Congolese workers who have been occupied in the Company since more than three years.

Moreover the Company's programme of social achievements towards the development of family life among Congolese people has been pursued.

Tribute was rendered to the members of the religious missions and social workers who devoted themselves to the accomplishment of this task.

HALKYN DISTRICT UNITED MINES LIMITED

The Twenty-Fourth Annual General Meeting of Halkyn District United Mines Ltd., was held on June 25, at Chester.

Mr. R. W. Bankes, C.B.E., the newly appointed Chairman, who presided, referred to the outstanding services rendered to the Company by his predecessor, Mr. E. Noel Humphreys, who had been compelled on medical advice to resign his appointments as Chairman and Managing Director of the Company.

Mr. Humphreys, he said, was appointed Deputy Chairman and Managing Director of the Company on its formation in 1928 and succeeded Sir Cecil Budd as Chairman in March 1946. He had continued to act in that capacity and as Managing Director until his recent resignation and the present flourishing condition of the Company was due in no small measure to his wise guidance of its affairs.

The meeting warmly endorsed the Chairman's suggestion that he should send to Mr. Humphreys an expression of appreciation of all he had done for the Company with best wishes for a speedy restoration to health.

The following details of operations during 1951 are contained in the Directors' Report and Chairman's Statement:—

Production of lead concentrates, which was derived mainly from further work on Lode 530 with useful contributions from reserve blocks in various old lodes, was increased to 2,155 tons; 266 tons of zinc concentrates were also produced.

The main cross-cut south was extended about 800 ft. and a new lode was intersected but the values so far exposed are not particularly encouraging.

Production of limestone continued but sales for agricultural purposes were restricted owing to abnormal rainfall and the consequent difficulty in spreading limestone on farm lands.

The accounts showed a profit for 1951 carried to Appropriation Account of £167,489; after provision for tax (£100,971), a dividend of 30 per cent (£32,394 net) and writing down of capital assets (£28,715), etc., the balance carried forward at the end of the year was £11,847.

The Chairman, in his statement, expressed appreciation of the efficient services rendered by the General Manager, Mr. G. W. Cradduck, and his staff.

The report and accounts were adopted and the dividend of 30 per cent for 1951 was confirmed.

FRONTINO GOLD MINES

The Annual General Meeting f Frontino Gold Mines Ltd., was held at Winchester House, Old Broad Street, London, on Friday, June 27.

The Rt. Hon. Sir Hugh O'Neill, Bart., P.C., M.P. (Chairman) who presided, in the course of his speech, said:—

When I addressed you last year I stated that in March of that year the Colombian Government had ended the system of differential exchange rates with the result that instead of getting rather more than 3 pesos per dollar for part of our gold sale proceeds we were receiving 2¼ pesos, and that the introduction of a fixed exchange rate of 7 pesos to the £1 would send up our costs in terms of sterling. I went on to say that the only way to meet this situation was by the production of a larger quantity of gold. Fortunately the programme recommended by our Consulting Engineers soon after their appointment, for securing a substantial increase in production was finalized in early April, and later on in July, the Colombian Mining Association decided to give gold producers an additional temporary bonus based on the number of oz. of gold produced, in order to save an industry which was fast being strangled by rising costs and high taxation. These two factors had a marked effect on our results and we finished the year with a profit of £99,764 as against £50,963 in 1950, an increase of £48,801.

With regard to the disposal of the profit for the year the Board recommend the payment on July 1 next of a final dividend of 1s. per share on the Preference shares, and a final dividend of 1s. 6d. per £1 stock on the Ordinary stock, and in addition a bonus of 6d. per share to both Preference and Ordinary Shareholders to celebrate the Centenary of the Company.

Shareholders may be somewhat puzzled by the reference to the Centenary of the Company in that the present Company was formed only 40 years ago, in 1911. That formation was the result of a reconstruction of a Company which was formed in 1886, and there were two earlier reconstructions dating back to the original Company which was formed in April 1852 under the name of the New Granada Co. The present Company is in direct succession to the New Granada Co. and it seems that mining nas been going on almost continuously on our existing property since the inception of the first Company.

Production in 1951 amounted to 111,989 tons compared with 88,260 tons in 1950, and 62,831 oz. gold were recovered as against 46,458 oz. gold last year, an increase of 16,373 oz.

In addition to the gold and silver recovered, the production of lead was continued, and resulted in a recovery of 357 tons of concentrates, which it is estimated will produce 184 tons of lead bullion and some gold and silver.

The total development in the year was 9,694 ft. compared with 4,367 ft. in 1950. Of this development 1,866 ft. in the drives averaged 18 dwt. over 42 in., 804 ft. in the rises averaged 20 dwt. over 44 in., and 20 ft. in the winzes averaged 27 dwt. over 76 in., making a total of 2,690 ft. with an average of 23 dwt. over a width of 54 in. Although the footage driven was over double that of 1950 it is planned to increase development still further in 1952 as in fact we must do if we are to continue production on the present scale and endeavour at the same time to increase the reserves of ore in the mine. It has become apparent that the percentage payability of all driving has dropped considerably. This is due to the fact that as greater efforts are made to develop new ore driving is continued, after the face passes out of one ore shoot, in the hope of encountering another. The matter is one which is very closely followed by the management to avoid the expense of abortive development, but in a mine as temperamental as Silencio a bold policy is absolutely necessary.

At December 31, 1951, the Proved Ore Reserves were 201,125 tons of an average value of 18.2 dwt. per ton, as against 186,921 tons of an average value of 17.6 dwt. last year, an increase in both tonnage and grade. The Indicated Ore Reserves were 104,617 tons of an average value of 8.1 dwt. per ton as against 88,182 tons of an average value of 7.0 dwt. per ton last year, and these also show increases. The results of development since the end of the year have been disappointing and I doubt whether anything has been added to the Reserves so far this year, despite increased activity. Nevertheless Silencio is a very patchy mine and I hope that before long we shall run into good ore again.

During the year the Cristales Mine was de-watered and thereafter a small labour force was employed in removing the sludge which had collected in the bottom of the mine and in replacing timbers which had rotted during the flooding. I expect that any day now driving on the bottom level will be restarted. At Cogote the work was confined to the cutting of a very lengthy track through dense undergrowth to permit supplies and men to be transported to the site of operations. It should be remembered that both the Cristales Mine and the Cogote prospect are long-term projects which it is hoped will eventually yield a quantity of ore of payable grade, but our main source of supply is and must be for many years to come the Silencio Mine.

I am glad to say that we had no serious labour troubles during the year.

The report and accounts were adopted.

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(b) One post in London of Inspector of Mechanical Engineering in Mines and Quarries;
(c) Five posts in the Provinces of Inspector of Mines and Quarries.

AGE. For post (a) candidates must be at least 35 years of age and for posts (b) and (c) at least 27 on 1st March, 1952.

QUALIFICATIONS and EXPERIENCE. Post (a)—Candidates must possess a University degree in mechanical engineering or be corporate members of the Institution of Mechanical Engineers or of the Institution of Mining Engineers or the Association of Mining Electrical and Mechanical Engineers; exceptionally a candidate of high professional attainments may be admitted without the specified qualifications. A sound general training and extensive practical experience in mechanical engineering is essential and a knowledge of mining plant and practices is desirable.

Post (b)—Candidates must possess a University degree in mechanical engineering or an equivalent qualification. They must also have had practical experience in mechanical engineering. Post (c)—Candidates must possess a First Class Certificate of Competency under the Coal Mines Act, 1911, and have held a responsible position at a coal mine. A varied experience is desirable and practical experience of metalliferous mining and quarrying will be an advantage.

SALARIES. Post (a) £1,459 rising by 5 increments to £1,775; posts (b) and (c) £917 rising by 8 increments to £1,151 (London). For posts (b) and (c) starting pay is linked to age 30 with deductions of approximately £31 for each year below 30 and the addition of approximately £31 for each year above 30 subject to a maximum of £980 at age 32 or over on entry, but higher starting pay may be considered for exceptionally well qualified candidates. Somewhat less for provincial posts. Prospects of promotion.

Further particulars and application forms from the Civil Service Commission, Scientific Branch, 7th Floor, Trinidad House, Old Burlington Street, London, W.1, quoting No. S4153/52. Completed applications must be returned by 13th August, 1952.

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The dividends will be payable in British currency, at par, at the rates declared in South African currency (Column No. 4), less South African non-resident shareholders' tax (Column No. 5).

COUPONS presented for payment at the London Office will, unless accompanied by Inland Revenue declarations, be paid at the rates shown in Column No. 11, which are arrived at after deduction of United Kingdom income tax (Column No. 10), at rates reduced to allow of relief in respect of Dominion taxes.

COUPONS presented at the Crédit Lyonnais, Paris, will be subject to the deduction of French income tax from the amounts of the dividends shown in Column No. 6.

NAME OF COMPANY (Each incorporated in the Union of South Africa.)	Dividend No.	Coupon No.	Amount of dividend declared per share	Deduction in respect of South African non-resident shareholders' tax, per share.	Amount of dividend after such deduction per share.	Provisional rate of relief authorised in the £.	Gross amount of dividend per share.	Rate of deduction of United Kingdom income tax in the £.	Amount of United Kingdom income tax deducted, per share.	Net amount of dividend per share
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
			s. d.	d.	s. d.	s. d.	s. d.	s. d.	d.	s. d.
City Deep, Ltd.	65	65	1 6	1.35	1 4.65	4 9	1 9.84	4 9	5.19	11.46
Consolidated M. Reef M. & E., Ltd.	85	82	2 9	2.475	2 6.525	4 9	3 4.033	4 9	9.508	1 9.017
Crown Mines, Ltd.	102	102	2 6	2.25	2 3.75	4 9	3 0.39	4 9	8.64	1 7.11
Durban Roodepoort Deep, Ltd. ...	63	63	2 6	2.25	2 3.75	4 9	3 0.39	4 9	8.64	1 7.11
East Rand Prop. Mines, Ltd. ...	65	66	2 6	2.25	2 3.75	4 9	3 0.39	4 9	8.64	1 7.11
Modderfontein East, Ltd.	50	31	2 0	1.8	1 10.20	4 9	2 5.11	4 9	6.91	1 3.29
Rand Mines, Ltd.	98	98	3 0	2.673	2 9.327	4 9	3 7.708	4 9	10.381	1 10.946
Rose Deep, Ltd.	94	94	1 9	1.575	1 7.425	4 9	2 1.475	4 9	6.05	1 1.37
*Transvaal Gold M. Ests. Ltd. ...	83	83	9	.675	8.325	2 7	9.56	6 11	3.306	5.0195

Coupons required to be paid at the London Office must be left at least four clear days for examination and may be presented any day (Saturdays excepted) between the hours of 11 and 2. Depositors will be notified at the time of deposit when the cheques will be ready.

Listing forms may be had on application.

Note: The Companies have been asked by the Commissioners of Inland Revenue to state:

Under the provisions of Section 348 and the 17th Schedule of the Income Tax Act, 1952, relating to "unilateral relief" from double taxation, South African tax applicable to the dividends is allowable as a credit against the United Kingdom tax payable in respect of the dividends. The deduction of tax at the reduced rates in the £ (Column No. 9) instead of at the Standard Rate of 9s. 6d. in the £ represents a *provisional* allowance of credit at the rates shown in Column No. 7. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be more or less than the rates shown in Column No. 7 but must not exceed three-quarters of the personal rate. Revision of the credit involves corresponding adjustments of the gross amounts of the dividends for United Kingdom tax purposes (Column No. 8).

THE GROSS AMOUNT OF THE DIVIDEND, PER SHARE, TO BE INCLUDED IN ANY STATEMENT OF TOTAL INCOME FOR UNITED KINGDOM INCOME TAX AND SURTAX PURPOSES IS SHOWN IN COLUMN No. 8.

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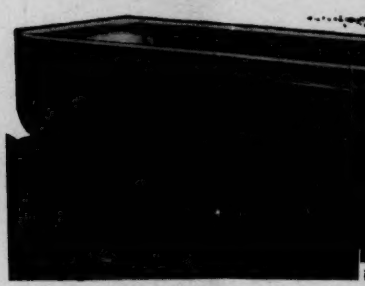

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